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OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

January 3, 1978

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

January 3, 1978 Volume 966 Number 1

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CONSOLIDATED LISTING OF RECENT OFFICIAL GAZETTE NOTICES RE PATENT AND TRADEMARK OFFICE PRACTICES AND PROCEDURES

PATENT NOTICES

The following is a compilation of the more important notices and rule changes which have been published in the OFFICIAL GAZETTE *from July 1, 1964, through December 31, 1977. These notices and rule changes are currently in effect unless otherwise noted.*

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INFORMATION AND CORRESPONDENCE

(1) OFFICIAL PATENT OFFICE MAILING ADDRESS REMAINS WASHINGTON, D.C.

The official mailing address for all communications sent to the Patent Office remains:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Any telegrams sent to the Patent Office must also bear the above identical address.

The physical location of the Patent Office is 2021 Jefferson Davis Highway, Arlington, Virginia. This address must not be used when addressing mail to the Patent Office.

No reference to Crystal Plaza, Virginia, should be made in the address of *any* communication intended for delivery to the Patent Office by the Post Office Department or Western Union.

Compliance with this instruction will help prevent any unnecessary delay in the delivery of mail, telegrams, etc.

C. A. KALK,
Feb. 20, 1969. *Director of Administration.*

(Office name change per Public Law 93–596, Jan. 2, 1975)

[860 O.G. 662]

(2) GROUP NUMBER SHOULD APPEAR ON COMMUNICATIONS RELATING TO PENDING APPLICATIONS

It is again requested that the Group number be typed on amendments and other communications relating to pending applications in order to expedite the handling of mail and to conserve manpower. The number of the Group should be placed on the right-hand side, opposite the Serial Number or name of applicant. In view of the vast amount of mail, continued careful attention to these details will do much toward avoiding delay in handling of mail.

C. A. KALK,
Nov. 6, 1969. *Director of Administration.*

[869 O.G. 345]

(3) 'IDENTIFICATION FOR APPLICATION CORRESPONDENCE

The Office is continuing to experience difficulty in matching incoming papers with the corresponding application files. This applies especially to responses to Office Actions, powers of attorney, changes of address, status letters, requests for extensions of time, and petitions.

A very necessary part of a complete identification of a pending application is the three-digit Group or Art Unit number, e.g., 110 or 111. Frequently, the Group Art Unit number is entirely omitted, or there are errors in this number. In the latter situation the error often occurs as a result of the case having been reassigned within the Office, and the communication is directed to an Examining Group other than that indicated in the most recent Office Action.

Where the Group Art Unit number is entirely omitted, the routine operations of the Application Branch must be interrupted solely for the purpose of determining the location of the application so that the communication can be properly routed. Under these circumstances the efficiency of the Application Branch is impaired and the incoming paper is delayed in reaching its proper destination. Where such papers are not essential to compliance with a statutory period or time limit for response, they may be returned for completion to identify the location of the files.

To assist the Office in expediting its business, it is requested that ALL papers relating to a pending application include the following information:

1. Serial number (checked for accuracy),
2. Group Art Unit number (copied from filing receipt or most recent Office Action),
3. Filing date,
4. Name of the Examiner who prepared the most recent Office Action.
5. Title of the invention.

To further reduce the burden on the Application Branch and the Examining Groups, it is also requested that the submission of additional or supplemental papers on a newly filed application be deferred until a filing receipt has been received. In the same vein, it would be appreciated if the filing of additional papers, relating to an allowed application were deferred until a notice of allowance (POL–85) was received.

If the above suggestions are adopted the processing of both new and allowed applications could proceed more efficiently and promptly through the Patent Office.

RICHARD A. WAHL,
Mar. 5, 1971. *Assistant Commissioner.*

[885 O.G. 2]

(4) IDENTIFYING APPLICATION CORRESPONDENCE WITH ISSUE BATCH NUMBER

Applicants or their attorney or agent can facilitate matching incoming papers with the corresponding application file by indicating the Issue Batch Number on all papers filed in the Office after receiving the Notice of Allowance and before the time the Issue Fee Receipt is received.

The Issue Batch Number is printed on the Notice of Allowance form in Box 4 in the lower left-hand corner below the address. The Issue Batch Number consists of a capital letter followed by two digits, for example; "A03," "D18," "F42," "J79." Any lower case letters before the Issue Batch Number should be ignored since they are the typist's initials. Use of the Issue Batch Numbers is important since the allowed applications are filed by these numbers.

Any paper filed after receiving the Issue Fee Receipt should include the indicated patent number rather than the Issue Batch Number. At this time in the processing, the Issue Batch Number is no longer useful since the application has been removed from the batch at the time the patent number was assigned.

RICHARD J. SHAKMAN,
Jan. 16, 1976. *Assistant Commissioner for Administration.*

[943 O.G. 519]

(5) HAND DELIVERY OF PAPERS

The notices of November 10, 1969 (869 O.G. 345) and September 8, 1970 (879 O.G. 667), regarding "Hand Delivery

of Papers," are superseded and the practice indicated below is hereby made effective.

Any paper which relates to a pending application may be personally delivered to an Examining Group. However, the Examining Group will accept the paper only if: (1) the paper is accompanied by some form of receipt which can be handed back to the person delivering the paper; and (2) the Examining Group being asked to receive the paper is responsible for acting on the paper.

The receipt may take the form of a duplicate copy of such paper or a card identifying the paper. The identifying data on the card should be so complete as to leave no uncertainty as to the paper filed. For example, the card should contain the applicant's name(s), Serial No., filing date and a description of the paper being filed. If more than one paper is being filed for the same application, the card should contain a description of each paper or item.

Under this procedure, the paper and receipt will be date stamped with the Group date stamp. The receipt will be handed back to the person hand delivering the paper. The paper will be correlated with the application and made an official paper in the file, thereby avoiding the necessity of processing and forwarding the paper to the Examining Group via the Mail Room.

The Examining Group will accept and date stamp a paper even though the paper is accompanied by a check or the paper contains an authorization to charge a Deposit Account. However, in such an instance, the paper will be hand carried by Group personnel to the Office of Finance for processing and then made an official paper in the file.

WILLIAM FELDMAN,
Jan. 29, 1974. *Deputy Assistant Commissioner for Patents.*

[919 O.G. 1070]

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(6) POST CARD RECEIPT REMINDER

Applicants and their attorneys or agents are reminded of the provision in Section 717.01(a) (now Section 503) of the Manual of Patent Examining Procedure relating to the use of post cards as "receipts" of papers filed in the Patent Office.

If a receipt for any paper filed in the Patent Office is desired, it may be had by enclosing with the paper a self-addressed post card identifying the paper. The Patent Office will stamp the receipt date on the card and place it in the outgoing mail.

The identifying data on the card should be so complete as to match the paper with the application or other document to which it is to be associated. For example, the document should be identified by the applicant's name(s), Serial No., filing date, appeal number, interference number, etc., and the paper should be identified by specifying the type thereof, viz, affidavit, amendment, appeal, application papers, brief, drawings, fees, motions, supplemental oath or declaration, petition, etc.

When papers for more than one document are filed under a single cover a return post card should be attached to the paper for *each* document for which a receipt is desired.

RICHARD A. WAHL,
Nov. 21, 1968. *Assistant Commissioner.*

[857 O.G. 667]

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(7) STATUS INQUIRIES

In an effort to sharply reduce the volume and need for status inquiries, the past policy that diligence must be established by making timely status requests in connection with petitions to revive is hereby discontinued.

When an application has been abandoned for an excessive period before the filing of a petition to revive, an appropriate terminal disclaimer may be required. It should also be recognized that a petition to revive must be accompanied by the proposed response unless it has been previously filed (Rule 137). Also, under Rule 113, "Response to a final rejection or action must include cancellation of, or appeal from the rejection of, each claim so rejected and, if any claim stands allowed, compliance with any requirement or objection as to form."

New Applications

Current examining procedures now provide for the routine mailing from the Examining Groups of Form POL–327 in *every* case of allowance of an application except where an Examiner's Amendment is promptly mailed. Thus, the separate mailing of a Form POL–327 or an Examiner's Amendment in addition to a formal Notice of Allowance (POL–85) in all allowed cases would seem to obviate the need for status inquiries even as a precautionary measure where the applicant may believe his new application may have been passed to issue on the first examination. However, as an exception, a status inquiry would be appropriate where a Notice of Allowance is not received within three months from receipt of either a Form POL–327 or an Examiner's Amendment.

Current examining procedures also aim to minimize the spread in dates among the various examiner dockets of each Art Unit and Group with respect to actions on new applications. Accordingly, the dates of the "oldest new applications" appearing in the OFFICIAL GAZETTE are fairly reliable guides as to the expected time frames of when the Examiners reach the cases for action.

Therefore, it should be rarely necessary to query the status of a new application.

Amended Applications

Amended cases are expected to be taken up by the examiner and an action completed within two months of the amendment date. Accordingly, a status inquiry is not in order after response by the attorney until five or six months have elapsed with no response from the Patent Office. A post card receipt for responses to Office actions, adequately and specifically identifying the papers filed, will be considered *prima facie* proof of receipt of such papers. Where such proof indicates the timely filing of a response, the submission of a copy of the post card with a copy of the response will ordinarily obviate the need for a petition to revive. Proof of receipt of a timely response to a final action will obviate the need for a petition to revive only if the response was in compliance with Rule 113.

In General

It is expected that this new policy will result in sharply reducing the number of status inquiries and permit the time now spent on them to be used in increasing Patent Office efficiency in other more essential areas.

Such status inquiries as may be still necessary may be more expeditiously processed by the Patent Office if each inquiry includes the application Serial Number, filing date, name of the applicant, name of the Examiner who prepared the most recent Office action, and Group Art Unit (taken from the most recent Office communication) in addition to the last known status of the application, and is accompanied by a stamped return-addressed envelope. Telephone inquiries regarding the status of applications should be directed to the group clerical personnel and not to the examiners. Inasmuch as the official records and applications are located in the clerical section of the Examining Groups, the clerical personnel can readily provide status information without consulting the examiners.

Status replies will be made by the Patent Office clerical support force and will only indicate whether the application is awaiting action by the Examiner or the applicant's response to an Office action. In the latter instance the mailing date of the Office action will also be given.

The Notices of Dec. 5, 1969 (869 O.G. 1031) and Sept. 22, 1965 (819 O.G. 444) are hereby superseded.

RICHARD A. WAHL,
Nov. 24, 1971. *Assistant Commissioner of Patents.*

[893 O.G. 810]

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(8) CHANGE OF ADDRESS

There recently has been an increased incidence in the number of applications suffering from disruptions in communications stemming from failure to notify the Patent and Trademark Office of a change of address on the part of applicant's representative (attorney or agent of record) in each application wherein he holds an active power of attorney. Applications have become abandoned as a result of an Office action being mailed to the old, uncorrected address and thereby failing to reach the representative at his new address sufficiently early to permit him to file a timely response. Accordingly, the requirement set out below is published as a reminder and is designed to ameliorate this problem.

Where an attorney or agent of record (or applicant, if he is prosecuting his application pro se) changes his correspondence address, he is responsible for promptly notifying the Patent and Trademark Office of his new correspondence address (including ZIP code number). A separate notification must be filed in *each application* for which he is intended to receive communications from the Office. The notification should also include his telephone number.

While the notification need take no particular form, it should be provided in a manner calling attention to the fact that a change of address is being made. Thus, the mere inclusion, in a paper being filed for another purpose, of an address different from the previously provided correspondence address, without mention of the fact that an address change is being made, would not ordinarily be recognized or deemed as instructions to change the address on the file record.

It is emphasized that the above-delineated responsibility is *additional* to the separate obligation (see 37 CFR 1.347) of a registered attorney or agent to notify the Attorney's Roster of any change of his address for entry on the register, which must be done in a letter separate from any notice of change of address filed in individual applications. That obligation continues without change.

The degree of care exercised in adhering to the foregoing requirement for notification of change of address in each concerned application will be a factor for consideration in deciding petitions filed under 37 CFR 1.137 to revive applications which have become abandoned because of a failure to timely receive an Office action addressed to the old address. In such instances, the showing of the cause of unavoidable delay must include an adequate showing that a timely notification of the change of address was filed in the concerned application, in a manner reasonably calculated to call attention to the fact that it was a change of address. If no such notification was made, or was made belatedly, the showing must include an adequate explanation of that failure or delay. A showing that notification was made on a paper filed in the Patent and Trademark Office listing *plural* applications as being affected will not be considered a proper notification.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

May 28, 1975.

[935 O.G. 1352]

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(9) CHANGE OF ADDRESS OR PRACTITIONER IN A PLURALITY OF PATENT APPLICATIONS

Change of Address

This notice is supplemental to the Notice of May 28, 1975, 935 O.G. 1352.

In those instances where a change in the correspondence address of a registered attorney or agent is necessary in a plurality of applications, and the number of applications is such as to cause undue hardship, the notification filed in each application may be a reproduction of a properly executed, original notification. The original notice may be sent to the Office of the Solicitor as notification to the Attorney's Roster of the change of address, or may be filed in one of the applications affected, provided that the notice includes an authorization for the public to inspect and copy the original notice in the event one of the applications containing a copy matures into a patent and the application containing the original paper is either pending or has become abandoned. The copies submitted in each affected application must identify where the original paper is located. Otherwise, the practice governing the filing of notifications of change of address remains the same.

Powers of Attorney

In the event of a need to file a change in the power of attorney in a plurality of applications of a common assignee or inventive entity, and the number of applications is such as to cause undue hardship, a single, original paper may be used provided that a reproduction of this original paper is supplied in each of the affected applications. The copy of the original paper must identify in which application the original paper is located and authorize the public to inspect and copy the original paper in the event one of the applications containing a copy matures into a patent and the application containing the original paper is pending or has become abandoned. The procedures and usual prerequisites for the filing of grants and/or revocations of power of attorney otherwise remain the same.

WILLIAM FELDMAN,
Sept. 9, 1976. *Deputy Assistant Commissioner for Patents.*

[951 O.G. 454]

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(10) ACCESS TO PATENT APPLICATION AND INTERFERENCE FILES

In order to insure that access to patent application and interference files is given only to persons who are entitled thereto or who are specially authorized to have access under Rule 14 of the Rules of Practice in Patent Cases, and to insure also that the file record identifies any such specially authorized person who has been given access to a file, the following practice will be observed by all personnel of the Patent Office:

1. Access, as provided for in the Rules of Practice, will be given on *oral request* to any applicant, patentee, assignee, or attorney or agent of record in an application or patent only upon *proof of identity* or upon *recognition* based on personal acquaintance.
2. Where a power of attorney or authorization of agent was given to a registered firm prior to July 2, 1971, access will be given upon oral request as in paragraph 1 above to any registered member or employee of the firm who has signatory power for the firm.
3. Unregistered employees of attorneys or agents, public stenographers, and all other persons not within the provisions of paragraphs 1 and 2 above will be given access only upon presentation of a *written authorization for access* signed by a person specified in paragraph 1 above, which authorization will be entered as a part of the official file.

ROBERT GOTTSCHALK,
Nov. 24, 1971. *Acting Commissioner of Patents.*

[893 O.G. 810]

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(11) EXPRESS MAIL

This notice is in response to a number of inquiries received in the Patent and Trademark Office regarding the notice on Express Mail of February 11, 1975, published in the OFFICIAL GAZETTE of March 11, 1975 (932 O.G. 340).

There are two types of Express Mail delivery offered by the U.S. Postal Service—"Post Office to Addressee" and "Post Office to Post Office." The only type of service which can be used for Express Mail directed to the Patent and Trademark Office is "Post Office to Addressee." This service provides for delivery to one of our employees in Room 1627, Department of Commerce Building, Washington, D.C., no later than 3:00 p.m. of the next workday following its deposit before 5:00 p.m. at any postal facility with an Express Mail window.

The only address that should be used for Express Mail sent to the Patent and Trademark Office is:

"Commissioner of Patents and Trademarks
Washington, D.C. 20231."

"Post Office to Post Office" Express Mail *does not* provide for delivery but instead is retained at the postal facility of the addressee for pickup. The Postal Service *does not* notify the addressee that this type of Express Mail has been received and is awaiting pickup. If not picked up, this mail is held for 15 days and then returned to the sender.

Therefore, since the Patent and Trademark Office does not have resources for picking up any mail, including Express Mail, the "Post Office to Post Office" Express Mail will not reach the Patent and Trademark Office.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

May 15, 1975.

[936 O.G. 1554]

(12) CERTIFICATE OF MAILING PROCEDURES

On November 1, 1976, the Patent and Trademark Office instituted the Certificate of Mailing Procedure by promulgating 37 CFR 1.8 in an attempt to reduce the number of problems resulting from late receipt of responses due to mail delays. This notice was published in the OFFICIAL GAZETTE on October 26, 1976 (951 O.G. 1342 and TM 210). Guidelines relative to this procedure were published in the OFFICIAL GAZETTE on November 16, 1976 (952 O.G. 918 and TM 174).

Although the new procedure has gained wide acceptance, it has not been entirely without problems. One major problem involves the correlation of the certification with the appropriate papers when presented on a separate sheet. In order to curtail this problem and other minor ones, the guidelines published on November 16, 1976, are superseded by the following guidelines. They are applicable to responses in both patent and trademark matters, as permitted by 37 CFR 1.8.

Guidelines

A) The certification requires a signature. Specifically, if the certification appears on a paper that requires a signature, two signatures are required, one for the paper and one for the certification. Although not specifically required by 37 CFR 1.8, it is preferred that the certificate be signed by the applicant, assignee, or registered practitioner.

B) When possible, the certification should appear on a portion of the paper being submitted. However, if there is insufficient space to make the certification on the same paper, such as in the case of the patent issue fee transmittal form PTO–85, the certification should be on a separate sheet securely attached to the paper.

C) When the certification is presented on a separate sheet, that sheet must (1) be signed and (2) fully identify and be securely attached to the paper it accompanies. The required identification should include the serial number and filing date of the application as well as the type of paper being filed, e.g., responses to rejection or refusal. Notice of Appeal, etc. An unsigned certification will not be considered acceptable.

Moreover without the proper identifying data, a certification presented on a separate sheet will not be considered acceptable if there is any question or doubt concerning the connection between the sheet and the paper filed.

If the sheet should become detached from the paper and thereafter not associated with the appropriate file, evidence that this sheet was received in the Office can be supported by submitting a copy of a post card receipt specifically identifying this sheet and the paper and by submitting a copy of the sheet as originally mailed. Attention is directed to the notice of November 21, 1968 published in the OFFICIAL GAZETTE (857 O.G. 667) relative to the use of post cards as receipts.

D) In situations wherein the correspondence includes papers for more than one application (e.g., a single envelope containing separate papers responding to Office actions in different applications) or papers for various parts of the Office (e.g., a patent issue fee transmittal form PTO–85 and an assignment), each paper must have its own certification as a part thereof or attached thereto.

E) In situations wherein the correspondence includes several papers directed to the same application (e.g., a proposed response under 37 CFR 1.116 and a Notice of Appeal), each paper should have its own certification as a part thereof or attached thereto.

Use of Stamped Certification

Some practitioners are placing the certification language on the first page of a paper with an inked stamp. Such a practice is encouraged because the certification is not only readily visible but also forms an integral part of the paper. An example of a preferred stamp is:

> I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on _____
> (Date of Deposit)
> _____
> Name of applicant, assignee, or Registered Representative
> _____
> Signature
> _____
> Date of Signature

Interpretations

The phrase "prior to expiration of the set period" in 37 CFR 1.8(a) includes the last day of the set period, which last day may be the "next succeeding secular or business day" as set out in 35 U.S.C. 21. Also, the filing of a 37 CFR 3.54 form to effect a filing under 37 CFR 1.60 is considered the filing of an application and is, therefore, excluded from the Certification of Mailing Procedure.

C. MARSHALL DANN,
Aug. 30, 1977. *Commissioner of Patent and Trademarks.*

[962 O.G. 20]

(13) SUBSTITUTE POWERS OF ATTORNEY

The Patent and Trademark Office has recently received correspondence in certain applications under the title "Substitute Power of Attorney" wherein the principal attorney of record attempted to name other attorneys as his substitute in those applications.

Since the power of the principal attorney may be revoked, or terminated as by his death, revocation or termination of said power of the principal attorney will also terminate the power of those appointed by him. Thus, a principal attorney may appoint an associate attorney whose power terminates with that of the principal, but he may not appoint a "substitute" and any attempt by the principal to appoint a "substitute" attorney whose power survives his own shall not be recognized by the Office.

WILLIAM FELDMAN,
Dec. 17, 1975. *Deputy Assistant Commissioner for Patents.*

[942 O.G. 1074]

(14) CHANGE IN LEGAL HOLIDAYS

Those doing business before the Patent Office are hereby reminded that by Public Law 90—363, 82 Stat. 250, effective January 1, 1971, Section 6103(a) of Title 5, United States Code, was amended to read as follows:

§ 6103. *Holidays*

(a) The following are legal public holidays:
New Year's Day, January 1.
Washington's Birthday, the third Monday in February.
Memorial Day, the last Monday in May.
Independence Day, July 4.
Labor Day, the first Monday in September.
Columbus Day, the second Monday in October.
Veterans Day, the fourth Monday in October.
Thanksgiving Day, the fourth Thursday in November.
Christmas Day, December 25.

Each of the holidays enumerated will constitute "a holiday within the District of Columbia," as referred to in Section 21, Title 35, United States Code.

WILLIAM E. SCHUYLER, JR.,
Dec. 2, 1970. *Commissioner of Patents.*

[881 O.G. 1707]

EDITORIAL NOTE: Sec. 6103(c) states that January 20 of each fourth year after 1965, Inauguration Day, is also a legal public holiday.

(15) RELOCATION OF CUSTOMER RELATIONS CENTER

In order to expand facilities in the Public Search Room of the Patent and Trademark Office, it has become necessary to relocate the Customer Relations Center.

As of January 19, 1976, the Center was moved to Building No. 2, Room 4C08. The telephone number of the Center will continue to be (703) 557–2003.

WILLIAM I. MERKIN,
January 1976. *Acting Assistant Commissioner for Administration.*

[943 O.G. 519]

(16) AVAILABILITY OF PATENT APPLICATION DRAWINGS FOR REPRODUCTION

Clients of private commercial reproduction services requesting patent application drawings to make drawing reproductions for U.S. and foreign filings have caused printing problems and delays in allowed applications in which the Base Issue Fee has been paid.

In order to prevent any delay in the printing and issuance of applications in which the Base Issue Fee has been paid, access to the drawings of patent applications which have been scheduled for printing will not be normally available. Delays in obtaining patent application drawings by commercial reproduction services, after the application has been scheduled for printing, can be avoided if requests for reproductions are made either before or promptly after receipt of the Notice of Allowance and prior to the payment of the Base Issue Fee.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.
May 6, 1975.

[934 O.G. 1324]

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(17) ACCEPTABLE DRAWINGS FOR PATENTS

Approximately ten years ago, the Office's standards for acceptable drawings with respect to certain matters including the blackness and minimum thickness of inked lines, and shading of drawings, were relaxed in order to reduce the backlog of informal drawings at that time.

Apparently, because of the increased use of pens with a round, open-end capillary tip in place of the conventional draftsman's drawing pen, the Office now has a problem of obtaining acceptable reproduction copies of thin, light and gray lines which appear on many drawings. As a result, approximately 10,000 drawings sheets filed each year are *not* acceptable for normal reproduction and microfilming from the printed copy. Special printing steps must be taken to try to print very thin or light lines. Inked lines should be at least 0.012 inch in width and no closer together than 0.05 inch. Shading lines should be constructed to meet these criteria for acceptable drawings. The inked lines must not rub off the standard bristol board sheet, and their reflectance should not exceed 12%.

Applicants and draftsmen are requested not to use thin or light lines on their drawings. In the future, drawing requirements will be more stringent regarding the blackness and minimum thickness of lines to be acceptable. The Chief Draftsman has been instructed to adhere strictly to the above standards and criteria after January 1, 1978 so that special printing requirements can be held to a minimum.

Persons interested in examples of acceptable and unacceptable lines for drawings may obtain one set of "Printed Examples from Unacceptably Inked Drawings" by writing to:

The Chief Draftsman
U.S. Patent and Trademark Office
Washington, D.C. 20231

RICHARD J. SHAKMAN,
Oct. 20, 1977. *Assistant Commissioner for Administration.*

[964 O.G. 21]

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(18) PUBLIC SEARCH ROOM FOR PATENTS

Establishment of New Procedures and Revisions of Regulations

One of the major obligations of the Patent and Trademark Office is to make patent information available for public inspection. The quality of this service depends upon promoting an environment conducive to research and maintaining the integrity of the files in the Public Search Room for Patents.

To emphasize our commitment to providing this environment with complete and orderly files for public use, the Patent and Trademark Office is establishing new procedures and revising the Regulations for using the facilities of the Public Search Room for Patents. The new procedures and revised Regulations will become effective August 23, 1976. The new procedures for the Search Room include the requirement that users obtain and show, prior to entering the Search Room facilities, a User Pass. This pass can be obtained at a special desk near the guard station. User Passes will be issued to persons not under prohibition from using the search facilities who agree to abide by the Regulations of the Public Search Room for Patents by signing a statement to that effect. User Passes are non-transferable and are valid until reissue or revocation for cause.

The new procedures also include the requirement that persons entering and exiting the Search Room use designated lanes. Persons exiting the Search Room will automatically pass electronic sensing equipment designed to detect any marked documents or materials being removed from the Search Room. The sensing equipment is capable of detecting marked documents and materials in briefcases and parcels and under clothing. The equipment does not use X-ray or other high energy radiation and is, therefore, completely safe and harmless to persons, photographic film, magnetic tape and electronic or mechanical devices such as wristwatches. The Patent and Trademark Office is now preparing older documents in the Classified and Application files for use under this system. All new patents are marked for sensing before being placed in the Classified files.

Whenever a marked document is transported past the sensing equipment, Patent and Trademark Office officials and the security guards will be alerted to the removal of the document, and a gate on the exit lane will lock. Persons triggering the alarm will be asked to cooperate in identifying the source for the alarm. Failure to cooperate when the alarm is triggered could result in detention of the person, seizure of any briefcase or the like, or other legal measures deemed necessary and appropriate in the specific case.

In order to assure that the changes in the Search Room fully apply to the Record Room, the entrance to the Record Room will be relocated within the Search Room. This change is currently under way.

The revised Regulations for the Search Room appear below, and a reprinting of the Regulations brochure incorporating the revisions will soon be available in the Search Room. The substance of the changes in the procedures and the revised Regulations for the Search Room, as well as any pertinent information that will assist users in the changeover, will be prominently posted in the Search Room. In order to maintain an environment conducive to research, the revised Regulations will be strictly enforced.

Although these new procedures and revised Regulations may cause some inconvenience, it is hoped that with your understanding and cooperation they will result in improvement in search facilities which will benefit all participants in our patent system.

REGULATIONS FOR THE PUBLIC USE OF RECORDS IN THE PUBLIC SEARCH ROOM FOR PATENTS OF THE PATENT AND TRADEMARK OFFICE

The Public Search Room for Patents is defined as that area comprising the foyers off the lobbies of Buildings 3 and 4 of Crystal Plaza; the offices, Microfilm Center, restrooms and telephone areas off these foyers; the stacks, Record Room, study and copier areas between the foyers; and the Mezzanine.

Under applicable statutes and regulations, including 49 U.S.C. 486(c); 41 CFR Subpart 101–20.3 and appropriate Sections of Department Organization Orders 30–3A and 30–3B of the Department of Commerce, the regulations appearing below are established for those using the facilities of the Public Search Room for Patents.

1. All persons using these facilities are subject to the regulations governing conduct on Federal Property, as specified in 41 CFR Subpart 101–20.3.
2. All posted Official Notices are to be complied with.
3. Smoking is not permitted except in designated areas.
4. Food and beverages in any form are not to be consumed except in designated areas.
5. Loud talking, use of radios, or any other form of activity which may disturb other members of the public is forbidden.
6. Children brought into the Public Search Room for Patents must not be allowed to disturb others.

7. Users of the facilities may not give the Patent and Trademark Office as a mailing address or otherwise suggest that mail may be received at the Patent and Trademark Office; nor may correspondence be conducted on official Patent and Trademark Office stationery.
8. Messages shall not be affixed to walls, desks, phone booths, or other public property, except designated message boards.
9. Patents and records shall not be removed from the facilities without proper authorization; nor shall they be mutilated. The unlawful removal or mutilation of records is forbidden by law and is punishable by fine or imprisonment or both (18 U.S.C. 2071).
10. The presence or use of equipment such as reproducing machines, typewriters and photographic equipment is prohibited without prior permission. The use of dictating equipment is prohibited, except in designated areas.
11. Library trucks or carts are to be used for transporting bundles only. They are not to be used for storage while making searches.
12. Patents temporarily removed from bundles for copying must be replaced promptly.
13. All bundles of patents must be promptly replaced in the stacks by the user.
14. The reserving of seats and/or working areas is prohibited.
15. Users of the Public Search Room for Patents are not permitted to use Patent and Trademark Office facilities beyond the Search Room after 5:00 p.m.
16. The front portion of the Public Search Room for Patents, i.e., that portion facing Crystal Plaza Drive and having a high ceiling, shall not be occupied by users after 6:00 p.m.
17. A valid User Pass must be shown upon request to authorized Patent and Trademark Office personnel.
18. User Passes are nontransferable and must be surrendered to authorized Patent and Trademark Office personnel upon request.
19. Packages, briefcases or other personal effects are subject to search by authorized Patent and Trademark Office personnel upon request.
20. All verbal requests for compliance with these regulations or other posted Patent and Trademark Office Notices pertaining to activity in the Public Search Room for Patents, when made by authorized Patent and Trademark Office personnel, must be promptly complied with.

Persons violating these regulations may be denied the use of the facilities in the Public Search Room for Patents, and may further be subjected to prosecution under the Criminal Code. Additionally, the name of any person violating these regulations who is registered to practice before the Patent and Trademark Office may be forwarded to the Solicitor for appropriate action under 37 CFR 1.348.

C. MARSHALL DANN,
July 9, 1976. *Commissioner of Patents and Trademarks.*

[949 O.G. 2]

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(19) USE OF PATENT EXAMINING GROUP FACILITIES

This notice is supplemental to the Notice of July 9, 1976, entitled "Public Search Room for Patents" that was published in the OFFICIAL GAZETTE on August 3, 1976 (949 O.G 2).

The primary function of the Patent and Trademark Office is the examination of applications for patents and the issuance of valid patents based upon a search and consideration of the best available prior art. This can be accomplished only through maintaining strict search file integrity within the Patent Examining Group Facilities.

Therefore, under the provision of Rule 2 of the "Regulations for the Public Use of Records in the Public Search Room for Patents of the Patent and Trademark Office," 949 O.G. 2, the regulations appearing below are established for those authorized members of the Public using the facilities of the Patent Examining Groups. The regulations become effective April 4, 1977.

Although these supplemental regulations may cause some inconvenience, it is believed that with the cooperation and understanding of the public, a more efficient and reliable examination system within the Patent Examining Groups Will result.

A copy of the following "Regulations for Users of the Patent Examining Group Facilities," will be posted in each of the Patent Examining Groups and the Public Search Room for Patents:

Regulations for Users of the Patent Examining Group Search Facilities

1. Group facilities are defined as those areas in Buildings, 3, 34 and 4 of Crystal Plaza designated Examining Groups.
2. The use of the Group facilities for search purposes by members of the public is strictly limited to the search of materials not available in the Public Search Room for Patents or the Scientific Library and when it does not conflict with the regular business of Patent and Trademark personnel and only between the hours of 8:45 a.m. and 4:45 p.m. on regular business days.
3. Authorized Officials, under these Regulations, include Supervisory Patent Examiners and Examining Group Directors.
4. Under applicable statutes and regulations, including 40 U.S.C. 486(c): 41 CFR Subpart 101–20.3; and appropriate Sections of Department Organization Orders 30–3A and 30–3B of the Department of Commerce, the Regulations appearing below are established for those members of the public using the Group Facilities.
   A. All persons using these facilities are subject to the Regulations Governing Conduct on Federal Property, as specified in 41 CFR Subpart 101–20.3.
   B. All posted Official Notices are to be complied with.
   C. A valid User Pass must be prominently displayed when searching in the Group Facilities. User Passes are nontransferable and must be surrendered upon request to authorized officials.
   D. All persons holding User Passes must register with the Group Receptionist, unless otherwise directed, in each Examining Group where they search and must sign a log (e.g., indicating time-in, time-out, name, User Pass number, class(es) and subclass(es) searched).
   E. No patents, records or other documents of the Patent and Trademark Office shall be removed from the Group Facilities except by express written authorization by an authorized official in the Examining Group where the material resides. Such authorization will not be given for U.S. patents and other material readily available through the Scientific Library.
   F. Smoking is not permitted except in designated areas.
   G. No food or beverage in any form are to be consumed except in designated areas.
   H. Loud talking, use of radios, and any other form of activity which may disturb other members of the public or Patent and Trademark Office personnel are forbidden.
   I. Children brought into the Group Facilities must not be allowed to disturb others.
   J. The presence or use of equipment such as dictation equipment, reproducing machines, typewriters and photographic equipment is prohibited without prior permission from an authorized official in the Examining Group where the use is intended and then is permitted where its use does not conflict with Regulation H.
   K. Patents and other documents must not be removed from their shoes for any reason other than for cursory study thereof while kept in close proximate association with the shoe and must not be moved out of their normal sequence.
   L. All patent shoes must be promptly replaced in their proper location in the shoe case.
   M. All textbooks, journals and the like must be returned to their proper location.

N. The reserving of seats and/or working areas is prohibited.

O. All packages, briefcases or other personal effects brought into the Group Facilities are subject to search by authorized officials upon request and must be removed when leaving the Group Facilities.

P. All verbal requests for compliance with these regulations or other posted Patent and Trademark Office Notices pertaining to activity in the Group Facilities, when made by authorized officials, must be promptly complied with.

5. Persons violating these regulations may be denied the use of the facilities in the Examining Groups and Public Search Room for Patents, and may further be subject to prosecution under the Criminal Code. Additionally, the name of any person violating these regulations who is registered to practice before the Patent and Trademark Office may be forwarded to the Solicitor for appropriate action under 37 CFR 1.348.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

[956 O.G. 1118]

(20) USE OF CERTIFICATE OF CORRECTION FORMS

The purpose of this notice is, to once again, remind patentees and their attorneys and agents to submit the text of any correction under 37 CFR 1.322 and 1.323 on the Certificate of Correction form, PTO–1050, which is available free of charge from the Patent and Trademark Office. The presentation of all corrections on this form permits its use as camera copy for prompt, direct offset printing of the Certificate of Correction.

Instructions for use of form PTO–1050 are printed on the top portion thereof, and are also set forth, in further detail, in Section 1402.02 of the Manual of Patent Examining Procedures. It is especially important that the typing be clean and clear. Both thin, light type and heavy, smudged type should be avoided. Changes and corrections are preferably made by use of white opaque correction fluid.

The typing should be within the borders printed on the form and a two-inch blank space should be left at the bottom of the last page of the form for the placement of the signature of the Attesting Officer.

Both sheets of the printed form should be forwarded to the Office. The copies should be stapled together only at the upper left-hand margin at the indicated location.

Copies of form PTO–1050 may be obtained, as needed, from either the Correspondence and Mail Division in Building 2, or from the receptionist in the lobby of Building 3, Crystal Plaza, Arlington, Va.

RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

May 10, 1977.

[959 O.G. 3]

(21) GOVERNMENT PUBLICATION SUBSCRIPTION SERVICE

The purpose of this notice is to inform subscribers of Federal Government publications serviced by the Government Printing Office, Superintendent of Documents, of the requirement to standardize subscriber change of address procedures.

It is imperative that the Government Printing Office be advised by each subscriber of an address change and that such advisement be accompanied by the latest subscription address label.

The Government Printing Office has the largest number of subscriptions of any activity in the United States. The Superintendent of Documents maintains about 835 mailing lists containing nearly 3 million addresses. Many of these subscribers frequently change their addresses and inform the Superintendent of Documents in a wide variety of methods. Some large organizations have as many as 20 identical subscriptions to the same street address but with different internal deliveries. Altogether the Government Printing Office is mailing nearly 5 million subscription copies each month. The Government Printing Office requests your cooperation to more effectively maintain the many mailing lists.

For your convenience, a change of address form is reproduced on the last page of the OFFICIAL GAZETTE.

BRADFORD R. HUTHER,
Acting Assistant Commissioner for Administration.

Aug. 9, 1977.

[962 O.G. 2]

(22) NOTICE TO OFFICIAL GAZETTE SUBSCRIBERS

The Patent and Trademark Office announces a change in the point of contact for subscribers who have not been receiving all of their copies of the patent and/or trademark sections of the OFFICIAL GAZETTE.

The Superintendent of Documents advises that expiration notices are sent out approximately three months in advance of the expiration date. However, subscribers should not be dependent upon such notices. In the event that a notice is not received within two months of the expiration date, the subscriber should renew his subscription with the Superintendent of Documents and *attach a label* from the envelope in which he receives the gazette, together with a check covering the amount of the subscription.

In case of complete stoppage, please send a copy of your order or expiration notice, together with proof of payment (copy of cancelled check or processed order), to Mr. S. J. Bania, Director, Office of Publications (Room 2–5C26), Patent and Trademark Office, Washington, D.C. 20231, Attention: Shirley A. Hammel (Telephone 703/557–3794), or Lillie M. Harrison (Telephone 703/557–1985).

This notice is effective with the publication date and supersedes the notice published on this subject in 934 O.G. 886, dated April 25, 1975.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

Sept. 12, 1975.

[939 O.G. 3]

RECORDS AND FILES

(23) ACCESSIBILITY OF ASSIGNMENT RECORDS

In view of a number of inquiries as to the manner in which Rule 1.12 of the Patent Office Rules of Practice, as amended August 23, 1965 (819 O.G. 443) is to be applied, the procedure which it is planned to follow in certain types of cases is set forth below.

1. Assignments relating to applications for registration of trademarks will be open to public inspection as heretofore.

2. The Office will not open certain parts only of an assignment document to public inspection. If such a document contains two or more items, any one of which, if alone, would be open to such inspection, then the entire document will be open. Thus, if an assignment covers either a trademark or a patent in addition to one or more patent applications, it will be available to the public ab initio; and if it covers a number of patent applications, it will be so available as soon as any one of them is patented. Assignments relating only to one or more pending applications for patent will not be open to public inspection.

3. If the application on which a patent was granted is a division or continuation of an earlier case, the assignment records of that case will be open to public inspection; similar situations involving continuation in part applications will be considered on their individual merits.

4. Assignment records relating to reissue applications will be open to public inspection.

EDWARD J. BRENNER,
Commissioner.

Dec. 15, 1965.

[822 O.G. 769]

(24) NOTIFICATION RE: CONFLICT IN ASSIGNMENT IN CERTAIN APPLICATIONS

Effective September 12, 1966, Assignment Branch will discontinue mailing notification in cases where there is a conflict

in assignment between an original application and its divisional, continuation, substitute, or continuation-in-part application.

Assignments from original applications are applied without charge ONLY to divisional, continuation, or substitute applications where the date of the assignment is prior to the filing date of the later-filed application. (Continuation-in-part applications require separate assignments if they are to be issued to the assignee.)

Practitioners are reminded of the provisions of Rule 334. Unless an assignment is filed at or prior to the date of payment of the issue fee, the patent will normally be issued in the name of the inventor.

Section 306 of the Manual of Patent Examining Procedures will be amended appropriately.

W. R. ARMSTRONG,
Director, Office of Patent Services.

Concurred:
(signed) R. A. WAHL,
Assistant Commissioner.

[830 O.G. 442 (Sept. 12, 1966)]

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(25) RECORDING OF INSTRUMENTS

Effective April 1, 1967, the Patent Office will accept and record legible certified copies of original assignments or other instruments.

The certified copy, if not in the English language, will not be recorded unless accompanied by a translation signed by the translator.

Certification shall be to the fact that the instrument submitted is a true copy of the original and shall be made by a notary public or, if in a foreign country, by a consular officer of the United States or an officer authorized to administer oaths and authenticated by a consular officer of the United States.

RICHARD A. WAHL,
Mar. 3, 1967. *Assistant Commissioner.*

[836 O.G. 1111]

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(26) REMINDER

Furnishing Assignment Data at Time of Payment of Base Issue Fee

Practitioners are once again reminded of Rule 334, revised November 1969, which requires that . . . "At the time of payment of the issue fee, a statement must be furnished indicating whether or not an assignment has been filed with the Patent Office. In the event an assignment has been filed, such statement must include the name of the assignee and indicate whether or not an acknowledgment of a recorded assignment has been received from the Patent Office."

The Issue Fee Transmittal Form POL 85*b*, revised December 1969 and May 1973, provides space (Item 2) for Assignment Data which should be completed to comply with the Rule. Unless an assignee's name and address are identified in Item 2 of the Issue Fee Transmittal Form POL 85*b*, the patent will issue to the applicant. *Assignment Data printed on the patent will be based solely on information so supplied.*

A request for correction of error arising from incomplete or erroneous information furnished in Item 2 of POL 85*b* will not be granted as a matter of course and will be subject to adherence to all the requirements of Rule 323.

The recording of instruments in the Assignment Division is not affected by this Notice.

WILLIAM I. MERKIN,
Dec. 19, 1974. *Assistant Commissioner for Administration.*

[930 O.G. 984]

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(27) CERTIFIED COPIES OF APPLICATION AS ORIGINALLY FILED

The Patent Office has discontinued placing the assignments of record on the file wrapper of patent applications, except when a title report is requested or upon allowance of the case. Accordingly, the copies of applications prepared in response to requests for a certified copy of a patent application as filed, will no longer include an indication of assignments. Applicants desiring an indication of assignments of record should request separately certified copies of assignment documents.

ROBERT J. RISH,
Acting Assistant Commissioner for Administration.

[887 O.G. 1042 (6-22-71)]

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(28) ASSIGNEE NAMES

Effective April 1, 1976, only the first appearing name of an assignee will be printed on the patent where multiple names for the *same* party are identified on the Base Issue Fee Transmittal form, POL-85b. Such multiple names may occur when both a legal name and an "also known as" or "doing business as" name is also included. This printing practice will not, however, affect the existing practice of recording assignments with the Office in the Assignment Division. The assignee entry on form POL-85b should still be completed to indicate the assignment data as recorded in the Office. For example, the assignment filed in the Office and therefore the POL-85b assignee entry might read "Smith Company doing business as (d.b.a.) Jones Company." The assignee entry on the printed patent will read "Smith Company."

For purposes of compiling and publishing the 1976 Annual Index of Patentees, this change will be retroactive to patents issuing on January 6, 1976.

Dec. 17, 1975. RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

[942 O.G. 186]

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(29) TITLE OF INVENTION CARRIED ON OFFICE RECORDS

The Patent and Trademark Office is experiencing an increased incidence in the number of newly filed applications in which the title of the invention is inconsistent within the papers. This has resulted in applicants requesting correction of the official filing receipt in many instances to indicate the title preferred by applicants.

Hereafter, whenever the title of the invention appears inconsistent within the papers of a newly filed application for patent, the records of the Office will carry the title as indicated on the first page of the specification and no corrected filing receipt will be issued to indicate another title. Note that 37 CFR 1.72(a) indicates that the title of the invention should appear as a heading on the first page of the specification.

It should also be noted that applicant may amend the title under 37 CFR 1.115 if any changes are subsequently desired before issuance of a patent.

BRADFORD R. HUTHER,
Acting Assistant Commissioner for Administration.

Aug. 31, 1977.

[962 O.G. 23]

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(30) MANUAL SUBSCRIPTIONS AND RULE AND STATUTE BOOKLETS

All subscriptions to various manuals and rules and the sale of various individual booklets which emanate from the Patent and Trademark Office, are handled by the Government Printing Office. Orders for new subscriptions or for the purchase of individual booklets should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Inquiries concerning subscriptions previously placed or concerning revision material issued under a subscription should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Customer Service Section SSOS, Washington, D.C. 20402.

However, as a service to patent and trademark practitioners and other interested parties, the following information is being published regarding revision schedules and rates for manual subscriptions, and rule and statute booklets. This information should be helpful in determining the currency of manuals and rules.

The Manual of Patent Examining Procedure (M.P.E.P.) is revised quarterly, the revisions being numbered consecutively and dated January, April, July and October of each year. The current subscription price for the M.P.E.P. is $19.65 (plus $4.95 for foreign mailing).

Revisions of the Manual of Classification for patents are presently published irregularly. However, beginning in 1978 it will be revised on a regular basis. These revisions will be published quarterly, dated January, April, July and October. The current subscription price for this manual is $44.00 (plus $11.00 for foreign mailing).

The Trademark Manual of Examining Procedure is normally revised anually, the revisions being numbered consecutively and dated January of each year. The current subscription price for the T.M.E.P. is $8.10 (plus $2.05 for foreign mailing).

The Trademark Rules of Practice (including the trademark statute) is revised from time to time whenever changes are made in the rules or the statute. The current Trademark Rules of Practice is the Ninth Edition, dated December 1976, and the current subscription price is $5.00 (plus $1.25 for foreign mailing).

The foregoing publications are available only by subscription. When revisions are issued, they are a part of the subscription and are mailed to subscribers automatically by the Superintendent of Documents of the Government Printing Office without additional charge. The original subscription price covers revisions until the Government Printing Office mails a notice of expiration of the subscription with a statement of the renewal fee necessary for continuing the subscription to the subscriber.

Both the patent rules and trademark rules are contained in an annual publication entitled 37 Code of Federal Regulations which is revised July 1 of each year. The price for the 1977 edition is $3.00 per copy.

The Patent Laws booklet is revised on an as-needed basis. The current edition is dated August 1976 and the current price is $2.10.

Due to the requirements of the printing process, these publications and revisions are generally not available until several months after the date which is printed on the revision or the booklet.

Date Oct. 12, 1977. LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

FEES AND PAYMENT OF MONEY

(31) FEES IN CONNECTION WITH AMENDMENTS TO PATENT APPLICATIONS

This notice supplements the Notice of September 10, 1965, 818 O.G. 1207, September 28, 1965, relating to the administration of the act of July 24, 1965, Public Law 89–83, increasing certain fees payable to the United States Patent Office.

That act provides for the payment of additional fees on presentation of certain claims during the prosecution of applications. This provision applies in the case of applications filed on or after October 25, 1965, the effective date of the act. In such cases, when any amendment is filed which presents additional claims over the total number covered by fees previously paid, it should be accompanied by any additional fees due.

As in the case of claims presented after an application is filed and before first action, described in the Notice of September 10, 1965, when independent claims are subsequently presented so that the number of uncanceled independent claims in the application as amended exceeds the number of such claims paid for, an additional fee of $10 is due for each such additional claim. Similarly, an additional fee of $2 is due for each claim added in excess of the number of uncanceled claims, independent or dependent, already paid for.

Treatment of Amendments Unaccompanied by Fees Due

Amendments filed during and after the prosecution of an application and not accompanied by the entire fee due upon such filing will be treated as follows:

If such an amendment is filed in reply to an Office action it will be regarded as not being fully responsive thereto and the practice set forth in section 714.03 of the Manual of Patent Examining Procedure will be followed, care being taken to avoid any abuse of this practice by attorneys as, for example, by habitual submission of such amendments without fees or with insufficient fees.

If an amendment which is not filed in response to an Office action is of such a nature as to require a fee and is not accompanied by the full fee required, it will not be entered and the applicant will be so advised.

Amendment During Interference

An amendment filed in connection with a motion to add counts to an interference (Rule 233) must be accompanied by the claim or claims to be added and with the appropriate fees, if any, which would be due if the amendments were to be entered. It may be that the amendments will never be entered. Only upon the granting of the motion is it necessary for the other party or parties to present the claims, but the fees must be paid whenever presented.

Claims which have been submitted in response to a suggestion by the Office for inclusion in an application must be accompanied by the fee due, if any.

Amendment After Requirement for Restriction

After a requirement for restriction or election of species, nonelected claims will be included in determining the fees due in connection with a subsequent amendment unless such claims are canceled.

Refunds

Money paid in excess or by mistake in connection with an amendment will be refunded in the usual manner.

Amendments affecting the claims cannot serve as the basis for granting any refund.

Money paid in connection with the filing of a proposed amendment will not be refunded by reason of the nonentry of the amendment.

EDWARD J. BRENNER,
Jan. 13, 1966. *Commissioner of Patents.*

[823 O.G. 814]

(32) DEPOSIT ACCOUNTS—STATUTORY FEE CHARGES

Beginning on May 1, 1966, and until further notice, statutory fees, including filing fees for patent, design, and trademark applications, issue fees, appeal fees and opposition, cancellation and petition fees may be charged against the deposit accounts provided for by Rule 25(a) of the Rules of Practice in patent cases. During this period the prohibition of Rule 25(b) against such charges will be suspended.

In view of the facts that these fees are indispensable parts of the actions to which they relate and that the charging of a fee against an account which does not contain sufficient funds to cover it cannot be regarded as a payment of the fee, it is evident that the overdrawing of a deposit account may result in the loss of a vital date and may also impose a substantial burden on the Patent Office in making appropriate correction of its records. It is, therefore, necessary that effective steps be taken to avoid such overdrafts, as follows:

Checks of all accounts will be made periodically, and if any account is found to have been overdrawn, it will be immediately removed from the active accounts and no further drafts on it will be honored. Prompt payment of the outstanding balance will be required and the depositor or his attorney may be called on for an itemized statement identifying all statutory fees charged against the account during the period in question in order that it may be ascertained whether any previously granted date should be withdrawn.

It is emphasized that the success of the procedure outlined above depends upon the maintenance of a sufficient balance in deposit accounts at all times to meet any charges made against them. The Office must, therefore, strictly refuse to permit any depositor who has once overdrawn his account to maintain such an account in the future and in the event that any substantial number of overdrafts occurs it may be necessary to reestablish the prohibition of Rule 25(b) against charging statutory fees against deposit accounts.

Accordingly, effective May 1, 1966, the requirement of Rule 25(a) that an amount sufficient to cover all charges made against an account must always be on deposit will be strictly enforced, regardless of whether any fee is included in such charges and where this requirement is not complied with the account involved will be removed from the active accounts.

EDWARD J. BRENNER,
Feb. 23, 1966. *Commissioner.*

[824 O.G. 1200]

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(33) PRACTICE IN THE USE OF ACCOUNTS FOR PAYMENT OF STATUTORY FEES

In the OFFICIAL GAZETTES of March 15, 22, and 29, there appeared copies of an announcement by the Commissioner providing for a trial use of accounts established under Rule 25 for the payment of statutory fees. A number of questions have come up in connection with the use of accounts in the payment of these fees prescribed by Public Law 89–83 and, in the interest of uniform practice, publication of a statement is warranted.

A general direction by an applicant or attorney to charge to an account these fees as they arise in any application prosecuted by the applicant, the attorney, or the firm will not be effective for such a purpose. Authority to make charges will be limited to a particular application.

A separate direction to charge shall be filed for each fee. Each such direction to charge a fee shall be transmitted on a separate sheet of paper and, in the case of fees based on modification of claims shall include the best estimate of the fee due. Failure to include such an estimate provides the basis for a refusal to enter any amendment transmitted therewith, as an incomplete response. Where variable fees are involved inclusion of a direction to charge or credit a deficiency or overpayment would appear appropriate.

An issue fee will not be charged to an account until a notice of allowance has been forwarded and a reply to that notice received.

For the purposes of determining the fee due the Patent Office, a claim will be treated as dependent if it contains reference to one other claim in the application. A claim determined to be dependent by this test will be entered if the fee paid reflects this determination. This does not, however, prevent the rejection of such a claim as improper, if, in fact, it is not a dependent claim.

EDWARD J. BRENNER,
Apr. 12, 1966. *Commissioner of Patents.*

[825 O.G. 1183]

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(34) DEPENDENT CLAIMS

Although the notice published on October 5, 1965, in 819 O.G. 3, explained that for the purposes of the present fee bill, Public Law 89–83, approved July 24, 1965, the Patent Office will consider a proper dependent claim as being one which incorporates by reference a single preceding claim, whether independent or dependent, and includes all the limitations of the claim so incorporated, there appears to be still some uncertainty on this matter and it is therefore thought to be desirable to elaborate it.

Since the initial determination, for fee purposes, as to whether a claim is dependent must be made by persons other than examiners, it is necessary, at that time, to accept as dependent virtually every claim which refers to another claim, without determining whether there is actually a true dependent relationship. Such acceptance does not, however, preclude a subsequent holding by the examiner that a claim is not a proper dependent claim.

An essential characteristic of a proper dependent claim is that it shall include every limitation of the claim from which it depends (35 U.S.C. 112) or in other words that it shall not conceivably be infringed by anything which would not also infringe the basic claim. Thus, for example, if claim 1 recites the combination of elements *a*, *b*, *c* and *d*, a claim reciting the structure of claim 1 in which *d* was omitted or replaced by *e* would not be a proper dependent claim, even though it placed further limitations on the remaining elements or added still other elements.

The fact that a dependent claim which is otherwise proper might require a separate search or be separately classified from the claim on which it depends would not render it an improper dependent claim, although it might result in a requirement for restriction.

The fact that the independent and dependent claims are in different statutory classes does not, in itself, render the latter improper. Thus, if claim 1 recites a specific product a claim for the method of making the product of claim 1 in a particular manner would be a proper dependent claim since it could not be infringed without infringing claim 1. Similarly, if claim 1 recites a method of making a product, a claim for a product made by the method of claim 1 could be a proper dependent claim. On the other hand, if claim 1 recites a method of making a specified product, a claim to the product set forth in claim 1 would not be a proper dependent claim if the product might be made in other ways.

Any claim which is in dependent form but which is so worded that it does not, in fact, include every limitation of the claim on which it depends, will be required to be cancelled as not being a proper dependent claim; and cancellation of any further claim depending on such a dependent claim will be similarly required. The applicant may thereupon amend the claims to place them in proper dependent form, or may redraft them as independent claims upon payment of any necessary additional fee.

The basis for the difference in fees between independent and dependent claims is the fact that the examination of a dependent claim is normally a comparatively simple matter after the claim on which it depends has been examined. This relationship, however, obtains only when the independent claim represents a bona fide attempt to define the invention and to distinguish it from the known prior art. Accordingly, the presentation of a claim which on its face is obviously unpatentable or indefinite, as basis on which other claims are dependent, is not considered to be proper practice. One example of such a practice involves the use of a claim drawn to "all the features of novelty herein disclosed," with other claims, which actually recite the features thought to be novel, being dependent on the first. A similarly objectionable arrangement would involve the use, as a basic independent claim, of a claim merely reciting "a wheeled vehicle," "an amino acid" or "an internal combustion engine."

Such a practice as that just described involves not only an attempt to evade the fee provisions of Public Law 89–83, but also the presentation of a claim known by the attorney or agent presenting it to be unpatentable. Any registered patent attorney or agent who makes a practice of presenting claims of this character may be called on to explain his actions.

(signed) EDWARD J. BRENNER,
June 8, 1966. *Commissioner.*

[828 O.G. 1]

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(35) DEPOSIT ACCOUNTS

The practice instituted on May 1, 1966, pursuant to the notice of February 23, 1966 (824 O.G. 1200), whereby statutory fees may be charged against deposit accounts, and such accounts are closed if overdrawn, has resulted in certain difficulties for the Patent Office and deposit account holders. It has been decided therefore to modify that practice as indicated below.

As was pointed out in that notice, the charging of a fee against an overdrawn account cannot be considered as payment of the fee until a proper balance is restored or payment is made in some other way. Accordingly, deposit account holders who charge such fees must assume the risk of losing vital dates if they do not maintain a proper balance in their accounts at all times.

Apart from this, however, the overdrawing of an account places a burden on the Patent Office, particularly where a number of items are charged after the overdraft occurs, and it is appropriate that those who are responsible for causing such a condition should bear the cost of correcting it. In view of this fact, and of the hardship frequently caused if an account is permanently closed, the practice of closing deposit accounts merely because they are overdrawn will be discontinued, effective August 1, 1966. In lieu thereof an overdrawn account will be immediately suspended and no charges will be accepted against it until a proper balance is

restored, together with a payment of ten dollars to cover the work done by the Patent Office incident to suspending and reinstating the account and dealing with charges which may have been made in the meantime. It is expected, however, that reasonable precautions will be taken in all cases to avoid overdrafts, and if an account is suspended repeatedly it will be necessary to close it.

Similarly, because of the burden placed on the Patent Office incident to the operation of deposit accounts, a charge of ten dollars will be made for opening each new account.

EDWARD J. BRENNER,
June 23, 1966. *Commissioner.*

[828 O.G. 377]

APPLICATION CONTENT

(36) GUIDELINES FOR DRAFTING A MODEL PATENT APPLICATION UNDER THE REVISED RULES

The following guidelines illustrate the preferred layout and content for patent applications. They have been prepared to supplement the amendments to the rules which are effective January 1, 1967. These guidelines are suggested for the applicant's use.

Arrangement and Contents of the Specification

The following order of arrangement is preferable in framing the specification and, except for the title of the invention, each of the lettered items should be preceded by the headings indicated.

(a) Title of the Invention.
(b) Abstract of the Disclosure.
(c) Cross-References to Related Applications (if any).
(d) Background of the Invention.
1. Field of the Invention.
2. Description of the Prior Art.
(e) Summary of the Invention.
(f) Brief Description of the Drawing.
(g) Description of the Preferred Embodiment(s).
(h) Claim(s).

(a) *Title of the Invention:* (See Rule 72(a).) The title of the invention should be placed at the top of the first page of the specification. It should be brief but technically accurate and descriptive.

(b) *Abstract of the Disclosure:* (See Rule 72(b), MPEP 608.01(a), and 831 O.G. 1328, October 25, 1966.)

(c) *Cross-References to Related Applications:* (See Rule 78 and MPEP 201.11.)

(d) *Background of the Invention:* The specification should set forth the Background of the Invention in two parts:

(1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions. The statement should be directed to the subject matter of the claimed invention.

(2) Description of the Prior Art: A paragraph(s) describing to the extent practical the state of the prior art known to the applicant, including references to specific prior art where appropriate. Where applicable, the problems involved in the prior art, which are solved by the applicant's invention, should be indicated.

(e) *Summary:* A brief summary or general statement of the invention as set forth in Rule 73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.

(f) *Brief Description of the Drawing:* A reference to and brief description of the drawing(s) as set forth in Rule 74.

(g) *Description of the Preferred Embodiment(s):* A description of the preferred embodiment(s) of the invention as required in Rule 71. The description should be as short and specific as is necessary to adequately and accurately describe the invention.

Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field to which the invention pertains, form a part of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.

(h) *Claim(s):* (See Rule 75.) A claim may be typed with the various elements subdivided in paragraph form. There may be plural indentations to further segregate subcombinations or related steps.

Reference characters corresponding to elements recited in the detailed description and the drawings may be used in conjunction with the recitation of the same element or group of elements in the claims. The reference characters, however, should be enclosed within parentheses so as to avoid confusion with other numbers or characters which may appear in the claims. The use of reference characters is to be considered as having no effect on the scope of the claims.

Claims should preferably be arranged in order of scope so that the first claim presented is the broadest. Where separate species are claimed, the claims of like species should be grouped together where possible and physically separated by drawing a line between claims or groups of claims. (Both of these provisions may not be practical or possible where several species claims depend from the same generic claim.) Similarly, product and process claims should be separately grouped. Such arrangements are for the purpose of facilitating classification and examination.

The form of claim required in Rule 75(e) is particularly adapted for the description of improvement type inventions. It is to be considered a combination claim and should be drafted with this thought in mind.

In drafting claims in accordance with Rule 75(e), the preamble is to be considered to positively and clearly include all the elements or steps recited therein as a part of the claimed combination.

Oath

(See Rule 65.) Where one or more previously filed foreign applications are cited or mentioned in the oath, complete identifying data, including the application or serial number as well as the country and date of filing, should be provided.

EDWARD J. BRENNER,
Date: Oct. 12, 1966. *Commissioner of Patents.*

[832 O.G. 5]

(37) USE OF METRIC SYSTEM OF MEASUREMENTS IN PATENT APPLICATIONS

In order to minimize the necessity in the future for converting dimensions given in the English system of measurements to the metric system of measurements when using printed patents as research and prior art search documents, all patent applicants are strongly encouraged to use either (1) only metric (S.I.) units, or (2) English units together with their metric system equivalents, when describing their inventions in the specifications of patent applications. This practice, however, is not being made mandatory at this time.

The initials S.I. stand for "Systeme International d'Unites," the French name for the International System of Units, a modernized metric system adopted in 1960 by the International General Conference of Weights and Measures based on precise unit measurements made possible by modern technology.

This request is made as part of the long-range program for conversion to metric units currently being conducted by the Federal Government.

Publications dealing with the metric system are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 and the American National Standards Institute, 1430 Broadway, New York, N.Y. 10018.

C. MARSHALL DANN,
July 1, 1974. *Commissioner of Patents.*

[924 O.G. 1104]

(38) FILING OF NON-ENGLISH LANGUAGE APPLICATIONS

This notice is in response to inquiries regarding the filing of applications in a language other than English. The Office has received a few such applications in the past in emergency situations where the filing of a non-English language specification was the only possibility of saving a foreign priority date or preventing the running of a statutory bar. In such situations the Office practice has been to accord the application a filing date if it includes all of the component parts required by 35 U.S.C. 111, and to require applicant to submit a verified translation of the previously filed application within two months.

In view of the inquiries received, it is considered appropriate that the Office clarify and publicize its practice in this area to avoid misunderstandings.

Accordingly, beginning February 1, 1976, the Office will accord a filing date to an application meeting the requirements of 35 U.S.C. 111 even though some or all of the application papers, including the written description and the claims, is in a language other than English and hence does not comply with 37 CFR 1.52, *provided:*

(1) the oath or declaration is signed and physically attached to the specification and claims to which it refers; and
(2) the application papers are accompanied by a statement, in English, from the applicant, his attorney or agent, certifying that is has been considered necessary to file the non-English language application in order to save a foreign priority date or prevent the running of a statutory bar.

A verified English translation of the non-English language papers should either accompany the application papers or be filed in the Office no later than two months after a notice requesting the translation has been mailed by the Office.

A subsequently filed verified English translation must contain the complete identifying data for the application in order to permit prompt association with the papers initially filed. Accordingly, it is strongly recommended that the original application papers be accompanied by a cover letter and a self-addressed return post card, each containing the following identifying data in English: (*a*) applicant's name(s); (*b*) title of invention; (*c*) number of pages of specifications, claims, and sheets of drawings; (*d*) whether oath or declaration was filed and (*e*) amount and manner of paying the filing fee.

The translation must be a literal translation verified as such by the translator, and must be accompanied by a signed request from the applicant, his attorney or agent, asking that the verified English translation be used as the copy for examination purposes in the Office. If the verified English translation does not conform to idiomatic English and United States practice it should be accompanied by a preliminary amendment making the necessary changes without the introduction of new matter prohibited by 35 U.S.C. 132. In the event the verified literal translation is not timely filed in the Office the application will be regarded as abandoned.

It should be recognized that this practice is intended for emergency situations to prevent loss of valuable rights and should not be routinely used for filing applications. There are at least two reasons why this should not be used on a routine basis. First, there are obvious dangers to applicant and the public if he fails to obtain a correct literal translation. Second, the filing of a large number of applications under the procedure will create significant administrative burdens on the Office.

The practice will be closely monitored to determine whether or not it should be continued.

C. MARSHALL DANN,
Dec. 31, 1975. *Commissioner of Patents and Trademarks.*

[942 O.G. 1552]

EXAMINATION OF APPLICATIONS

(39) INFORMAL APPLICATIONS OF FOREIGN APPLICANTS

This Notice is of special interest to attorneys and agents prosecuting applications on inventions originating abroad.

Many applications filed in this Office correspond in form and substance to the requirements (regulations) of countries foreign to the United States. Since they were not originally drafted to comply with our Rules of Practice, especially those based on 35 U.S.C. 112, the first examination cannot be the full and complete one contemplated under current examining procedures. This first examination is necessarily limited, under MPEP 702.01, to pointing out the informalities and citing the results of a search, the search being based upon the invention so far as it can be understood from the foreign type of claims, often coupled with a somewhat generalized disclosure. Since U.S. Patent Office policy is to accord equal treatment to *all* cases regardless of origin, current examining procedures as explained in the address reprinted in 803 O.G. 893, subject these applications to final determination on the second action. It is obviously to applicant's advantage to *file* the application with an adequate disclosure and with claims which conform to the U.S. Patent Office usages and requirements. This should be done whenever possible. If, however, due to the pressure of a Convention deadline or other reasons, this is not possible, applicants are urged to submit *promptly, preferably within three months after filing,* a preliminary amendment which corrects the obvious informalities. The informalities should be corrected to the extent that the disclosure is readily understood and the claims to be initially examined are in proper form, particularly as to dependency, and otherwise clearly define the invention. "New matter" must be excluded from these amendments since preliminary amendments do not enjoy original disclosure status, section 608.04(b), MPEP.

EDWARD J. BRENNER,
Mar. 4, 1965. *Commissioner of Patents.*

[812 O.G. 1295]

(40) EXAMINATION OF CLAIMS FOR PATENTABILITY UNDER 35 U.S.C. 103

The purpose of this notice is to inform the public of the current Patent and Trademark Office policy concerning determinations of obviousness under 35 U.S.C. 103 in view of the recent Supreme Court decision in *Sakraida* v. *Ag Pro,* 189 USPQ 449 (1976).

The following text is a copy of a memorandum issued to all patent examining personnel relative to this topic.

"A clarification of the policy of the Patent and Trademark Office in the examination of claims for patentability under 35 U.S.C. 103 seems in order at this time in view of the Supreme Court's decision in *Sakraida* v. *Ag Pro,* 189 USPQ 449 (decided April 20, 1976) which is similar to the Court's earlier decision in *Anderson's-Black Rock, Inc.* v. *Pavement Salvage Co.,* 163 USPQ 673 (decided December 8, 1969).

"Office policy has consistently been to follow *Graham* v. *John Deere Co.,* 148 USPQ 459 (decided February 21, 1966) in the consideration and determination of obviousness under 35 U.S.C. 103. The three factual inquiries enunciated therein as a background for determining obviousness are as follows:

1. Determination of the scope and content of the prior art;
2. Ascertaining the differences between the prior art and the claims in issue; and
3. Resolving the level of ordinary skill in the pertinent art.

"Attention is directed to MPEP Section 706 for a more complete discussion of the application of the Graham test.

"The Supreme Court reaffirmed and relied upon the Graham three-pronged test in its consideration and determination of obviousness in the fact situations presented in both the Ag Pro and Black Rock decisions. In each case, the Court went on to discuss whether the claimed combinations produced a 'new or different function' and a 'synergistic result,' but clearly decided whether the claimed inventions were unobvious on the basis of the three-way test in Graham. Nowhere in its decisions in those cases does the Court state that the 'new or different function' and 'synergistic result' tests supersede a finding of unobviousness or obviousness under the Graham test.

"Accordingly, examiners should continue to apply the test for patentability under 35 U.S.C. 103 set forth in Graham. It should be noted that the Supreme Court's application of

the Graham test to the fact circumstances in Ag Pro is somewhat stringent, as it was in Black Rock."

July 8, 1976.

C. MARSHALL DANN,
Commissioner of Patents & Trademarks.

[949 O.G. 3]

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(41) CLAIMS COPIED FROM PATENTS

Applicants and their attorneys or agents are reminded of the requirement of Rule 205(b) (37 CFR 1.205(b)) of the Rules of Practice that "Where an applicant presents a claim copied or substantially copied from a patent, he must, at the time he presents the claim, identify the patent, give the number of the patented claim, and specifically apply the terms of the copied claim to his own disclosure, unless the claim is copied in response to a suggestion by the Office."

The requirement of Rule 205(b) (37 CFR 1.205(b)) applies to claims copied in an application at the time of filing as well as to claims copied in an amendment to a pending application. If an applicant, attorney, or agent presents a claim copied or substantially copied from a patent without complying with Rule 205(b) (37 CFR 1.205(b)) the examiner may be led into making an action different from what he would have made had he been in possession of all the facts. Therefore, failure to comply with Rule 205(b) (37 CFR 1.205(b)), when submitting a claim copied from a patent, may result in the issuance of an Order To Show Cause why the application should not be stricken from the files of the Patent Office. If a satisfactory answer is not filed within the period set in the Order it may be necessary to strike the application under Rule 56 (37 CFR 1.56).

This reminder is being published to emphasize to applicants and their attorneys or agents the importance of complying with the requirement of Rule 205(b) (37 CFR 1.205(b)) at the time the claim is copied.

WILLIAM FELDMAN,

Apr. 10, 1974. *Acting Assistant Commissioner for Patents.*

[922 O.G. 442]

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(42) EXAMINATION OF PATENT APPLICATIONS HAVING AN ISSUE OF FRAUD

This notice deals with the general procedures established within the Patent Office for the handling, during ex parte examination, of applications in which, or in relation to which, some facts appear or representations are made raising an issue of fraud.

Such applications should be forwarded by the examiner to the Office of the Assistant Commissioner for Patents as soon as the facts or representations are discovered. The application will then be reviewed and a determination made as to whether immediate action on the issue of fraud is necessary or whether the consideration of such an issue should be delayed until after the normal ex parte examination by the examiner (if such examination has not previously taken place).

Where compelling reasons dictate immediate action, the application will not be returned to the examining group for normal ex parte examination until such action is complete. Otherwise, the application will be returned to the examining group. The examiner will complete the examination as to all matters except that any issues relating to possible fraud will not be considered or commented upon. When this examination is completed the application will be returned to the Office of the Assistant Commissioner for Patents. An investigation will then be undertaken to resolve the issues relating to the possible fraud. Such an investigation may include a requirement for additional information from applicant, or from the examiner, should it be necessary for the proper conduct of the investigation.

If the investigation reveals a prima facie case of fraud an Order to Show Cause why the application should not be stricken under Rule 56 of the Rules of Practice [37 CFR 1.56] will be issued.

If a prima facie case of fraud does not exist, or is adequately rebutted, a decision will be entered in the application file stating that the Patent Office has found no evidence necessitating striking the application. The application will then be returned to the examining group or other appropriate Patent Office section for further action.

WILLIAM FELDMAN,

Jan. 2, 1975. *Acting Assistant Commissioner for Patents.*

[930 O.G. 1455]

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(43) PRACTICE RE MARKUSH-TYPE CLAIMS

This notice deals with Markush-type claims which include a plurality of alternatively usable substances or members. In most cases this recitation by enumeration is used because there is no appropriate or true generic language.

Where an application claims two or more independent and distinct inventions, the Commissioner, under the provisions of 35 U.S.C. 121, may require the application to be restricted to one of the inventions.

A Markush-type claim is directed to "independent and distinct inventions," if two or more of its members are so unrelated and diverse that a prior art reference anticipating the claim with respect to one of the members would not render the claim obvious under 35 U.S.C. 103 with respect to the other member(s).

If the claim is of that nature, the examiner is authorized to reject it as an improper Markush claim and for misjoinder under 35 U.S.C. 121 and to require the applicant to restrict the application to a single invention. In making such a requirement, the examiner will (1) clearly delineate the members or groups of members believed to constitute improperly joined inventions, and (2) state reasons fully explaining why they are independent and distinct. Applicant's response to such a requirement should be an election of a single adequately disclosed and supported invention, with or without restriction of the claim(s) to that invention. Of course, the response must not introduce new matter into the application. See 35 U.S.C. 132 and *In re Welstead*, 59 CCPA 1105, 463 F. 2d 1110, 174 USPQ 449 (1972). A refusal to elect a single invention will be treated as a non-responsive reply.

If the members of the Markush group are sufficiently few in number or so closely related that a search and examination of the entire claim can be made without serious burden, the examiner is encouraged to examine it on the merits, even though it is directed to independent and distinct inventions. In such a case, the examiner will not follow the procedure outlined in the preceding paragraph and will not require restriction.

Where the examiner has rejected the claim and required restriction and the applicant has responded without restricting the claim(s) to a single invention, the examiner shall, if the position is adhered to, again reject the claim and any other Markush claims not restricted to the elected invention. No further examination of these claims is required unless and until such rejection has been overcome. However, if the search of the single elected invention develops prior art which would render both the elected invention and the improper Markush claim(s) unpatentable, such prior art may be applied in rejections of both without a complete search of the subject matter of the improper Markush claim(s). Otherwise, only true generic claims and those restricted to the elected invention will be examined in the usual manner.

Review of the rejection will be by appeal to the Board of Appeals under 35 U.S.C. 134.

C. MARSHALL DANN,

May 1, 1974. *Commissioner of Patents.*

[922 O.G. 1016]

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(44) RESTRICTION BETWEEN INVENTIONS

The practice set out in the notice of June 20, 1968 (852 O.G. 509) is hereby revised as follows.

Under the statute an application may properly be required to be restricted to one of two or more claimed inventions only if they are able to support separate patents and they are either independent or distinct.

If it is demonstrated that two or more claimed inventions have no disclosed relationship ("independent"), restriction should be required, and it is not necessary to further show that the claimed inventions are distinct. If it is demonstrated that two or more claimed inventions have a disclosed re-

lationship ("dependent"), then a showing of distinctness is required to substantiate a restriction requirement.

Where inventions are neither independent nor distinct, one from the other, or they are not sufficiently different to support more than one patent, their joinder in a single application must be permitted.

Every requirement to restrict has two aspects, (1) the reasons (as distinguished from the mere statement of conclusion) why the inventions *as claimed* are either independent or distinct, and (2) the reasons for insisting upon restriction therebetween.

In order to support a requirement to restrict between combination and subcombination inventions, two-way distinctness must be demonstrated.

If it can be shown that a combination, as claimed (1) does not require the particulars of the subcombination as claimed for patentability, and (2) the subcombination can be shown to have utility either by itself or in other and different relations, the inventions are distinct. When these factors cannot be shown, such inventions are not distinct.

Two or more claimed subcombinations, disclosed as usable together in a single combination, and which can be shown to be separately usable, are usually distinct from each other.

In applications claiming inventions in different statutory categories only one-way distinctness is needed to support a restriction requirement. For example, in applications containing claims to both process and apparatus, distinctness may be shown if (1) the process as claimed can be practiced by hand or by another materially different apparatus, or (2) the apparatus as claimed can be used to practice another and materially different process.

As in the notice of May 1, 1974 concerning Markush-Type claims (922 O.G. 1016), if the search and examination of an entire application can be made without serious burden, the examiner is encouraged to examine it on the merits, even though it includes claims to distinct or independent inventions.

WILLIAM FELDMAN,
Apr. 9, 1975. *Deputy Assistant Commissioner for Patents.*

[934 O.G. 150]

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(45) CITATION OF PRIOR ART BY APPLICANTS

The purpose of this notice is to set forth positive guidelines for applicants, their attorneys and agents who desire to submit prior art for consideration by the Patent Office. Such citations of relevant art are welcomed and are encouraged. In order that they may be most effectively considered by the examiner, however, with as little disruption of the regular examination process as possible, it is requested that they be submitted in accordance with the following guidelines.

(1) Citations should be submitted within three months after the application filing date if possible. Any citation made after the first action on the merits (if this occurs more than three months after filing) should be accompanied by an explanation of why it was not earlier presented. This may take the form of a statement that it was made as soon as the art or other material was discovered, or as soon as its pertinency was appreciated, indicating the date of discovery of the cited material or its pertinency.

(2) Full text copies of the pertinent portions of all such prior art citations or other material relevant to patentability of the claimed invention should be supplied, whether the citation is made in a separate paper or in the specification of the application. This will be unnecessary in the case of pending or abandoned United States applications (e.g. Defensive Publications). In the case of publications, a copy of the title page, its copyright notice or other indication of a publication date, and copies of the entire pages which contain the text of the relevant material will be sufficient.

While patent copies are, of course, available in the Patent Office, failure of the applicant to include copies of the cited art means that the examiner must interrupt his examination until copies can be ordered and received. Since the person making the citation will have copies in hand, an overall saving in time and more expeditious examination will result if copies are supplied with the citation.

(3) If the reference is not in English, a translation of its pertinent portions should be included.

(4) Accompanying each citation should be an indication of its pertinency to the claimed subject matter, together with any reasons applicant may wish to point out why the claims are considered to be patentable over the cited material.

All citations of prior art or other material submitted in accordance with the above guidelines and submitted before all claims have been indicated as allowable will be fully considered by the examiner.

While the Patent Office will not knowingly ignore any prior art which might anticipate or suggest the claimed invention, no assurance can be given that cited art or other material not submitted in accordance with these guidelines will be considered by the examiner. Consequently, any patent issuing on the application in question would not be expected to be accorded the usual presumption of validity with respect to such cited art or material.

After the claims have been indicated as allowable by the examiner, e.g., by the mailing of an *Ex parte* Quayle action, a notice of allowability (POL–327), an examiner's amendment (POL–37), or a Notice of Allowance, any citations submitted will be placed in the file. Since prosecution has ended, however, such submissions will not ordinarily be considered by the examiner unless the citation is accompanied by:

(a) A proposed amendment cancelling or further restricting at least one independent claim and narrowing the scope of protection sought;
(b) A timely affidavit under Rule 131 with respect to the material cited; or
(c) A statement by the applicant or his attorney or agent that, in the judgment of the person making the statement, the prior art or other material cited raises a serious question as to the patentability of the claimed subject matter.

If the material is submitted after the base issue fee has been paid, it must also be accompanied by a petition under Rule 183 (37 CFR 1.183) requesting a waiver of Rule 312 (37 CFR 1.312). Such petition, if granted, would result in review of the art by the examiner and possible entry of the amendment.

Submitted citations will not in any way diminish the obligation of examiners to conduct independent prior art searches, or relieve examiners of citing pertinent prior art of which they may be aware, whether or not such art is cited by the applicant. Nothing in this notice is intended to relieve applicants of any responsibility they may have to cite known prior art to the Patent Office.

If the specification or a separate paper filed in the application contains citations relating to background material, applicant has the responsibility of determining whether or not such material is sufficiently relevant to the claimed invention that full compliance with these guidelines is necessary.

Prior art submitted by applicant in the manner provided herein will not be supplied with an Office action, but will be listed on the Form PO–892, "Notice of References Cited," along with other prior art relied upon by the examiner during the examination. Only that prior art listed by the examiner on Form PO–892, will be printed on the patent. However, the complete listing of applicant's citations will be in the application file and will be available for inspection by the public after issuance of the patent.

Citations of prior art may be placed of record in the patented file after the grant of the patent at the request of the patentee (see Section 100(d) of Title 35, United States Code, for definition of patentee). Any such submissions by the patentee will be placed in the patented file without comment by the Patent Office. Citations submitted to the Patent Office by third parties will not be placed in the record of a patented file unless the party submitting the art certifies that he has sent the owner of record copies of the cited art and of his letter transmitting it to the Patent Office.

Prior Notices

This notice supersedes the notices of:
December 10, 1963 (797 O.G. 733)
April 24, 1964 (802 O.G. 601)
June 22, 1964 (804 O.G. 1)
July 24, 1964 (805 O.G. 294)
April 13, 1967 (837 O.G. 1032)

WILLIAM FELDMAN,
Aug. 12, 1974. *Deputy Assistant Commissioner for Patents.*

[926 O.G. 2]

(46) CITATION OF PRIOR ART BY APPLICANTS

This notice supplements the notice of August 12, 1974, published in the OFFICIAL GAZETTE of September 3, 1974 (926 O.G. 1), and is in response to some of the concerns expressed by members of the patent bar. That notice set forth guidelines the following of which would result in assurance by the Office that the examiner will fully consider the prior art or other material submitted by applicants, their attorneys and agents.

One of the guidelines stated, "If the reference is not in English, a translation of its pertinent portions should be included." In recognition of the high costs of translations, that guideline is hereby modified to accept an alternative to a translation. Accordingly, in lieu of a translation, it shall be sufficient, for purposes of the notice of August 12, 1974, if an equivalent English language patent or publication is provided and identified as an equivalent.

Also, where the applicant has submitted prior art in accordance with the guidelines in a prior application, reference to the prior application and the submission therein will be sufficient for the continuing application. Of course, any change in applicant's position regarding the cited art and its relevancy to the claimed subject matter should be indicated.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

May 19, 1975.

[935 O.G. 902]

(47) REVISED PROCEDURES FOR RECORDING SEARCHES AND CONSIDERATIONS OF CERTAIN PRIOR ART

In order to provide a more complete, accurate and uniform record of what has been searched and considered by the examiner for each application the Patent and Trademark Office has established revised procedures for recording search data in the application file. Such a record is of importance to anyone evaluating the strength and validity of a patent, particularly if the patent is involved in litigation. These new procedures will also facilitate the printing of certain search data on patents.

Under the revised procedures, searches are separated into two categories and listed, as appropriate, in either the "SEARCHED" box or a newly added "SEARCH NOTES" box on the file jacket.

Until file jackets can be reprinted to include a second search data box, all file jackets for new applications will have the "SEARCH NOTES" box stamped therein by the Mail Room. If additional space is required, entries will be continued on the outside right flap of the file jacket.

The revised procedures will apply to all new applications in which the first search is made after April 1, 1977 and do not affect the manner in which references are listed on the form PTO–892. "Notice of References Cited." Appropriate changes in the Manual of Patent Examining Procedure will be made.

A. "SEARCHED" Box Entries

Search entries made here, except those for search updates (see item A. 3 below), will be printed under "Field of Search" on the patent front page. Therefore, the following searches will be recorded in the "SEARCHED" box by the examiner along with the date and the examiner's initials, according to the following guidelines:

1. *A complete search of a subclass,* including all United States and foreign patent documents and other publications placed therein.
   The complete classification (class and subclass) will be recorded.
2. *A limited search of a subclass,* for example, a search that is restricted to an identifiable portion of the patent documents placed therein. If, however, only the publications in a subclass are searched, such an entry is to be made under "SEARCH NOTES" rather than under "SEARCHED." (See item B. 4 below.)
   The class and subclass, followed by the information defining the portion of the subclass searched in parenthesis, will be recorded.
3. *An update of a search previously made.*
   This search entry will be recorded in a manner to indicate clearly which of the previously recorded searches have been updated, followed by the expression "(updated)." Search update, entries, although recorded in the "SEARCHED" box, will not be printed.
   When a search made in a parent application is updated during the examination of a continuing application, those searches updated, followed by "(updated from parent S.N. ————————)" will be recorded. If the parent has been patented, the patent number "Pat. No. ————————" instead of serial number in the above phrase will be recorded.
4. *A mechanized search* of a file of documents in a specific art, conducted by using key terms to retrieve documents. The name of the mechanized search system as it appears in the following list will be recorded along with the expression "MS File" to indicate mechanized search file.

Mechanized Search Systems

Termatrex Systems:

Automatic Fuel Controls
Boots & Shoes
Chemical Testing
Combined Fasteners
Electrical Contact Materials
Surface Bonding Using Critical Metal

Edge-Notched Card System:

Fluid Devices

Punch Card Systems:

Electrolysis
Organometallics
Steriods

Computer Controlled Microfiche Search Systems (CCMSS):

A-D Convertors
Digital Data Processing Systems
Special Purpose Digital Processing Systems

When a search with a Termatrex or Edge-Notched card system is conducted, the examiner will complete form PTO–1041 in two copies, recording all queries searched, even those which yield only non-relevant documents. All documents returned by the system in response to a query which are not actually reviewed will have an "X" drawn through their associated access and patent numbers. The examiner will place one copy of the form PTO–1041 in the application file on the right flap of the file jacket, the other copy of the form PTO–1041 will be forwarded to the Office of Search Systems.

When conducting a search with a Punched Card system, the examiner will place in the application file the Code Sheet on which the terms searched have been marked along with the machine tape listing the documents retrieved. Any document not actually reviewed will have an "X" drawn through that document's number on the listing.

When conducting a search with the CCMSS search systems, the machine-produced search report, which lists the terms and tagged documents, will be placed in the application file on the right flap of the file jacket. Any tagged document not actually reviewed will have an "X" drawn through that document number on the search report.

B. "SEARCH NOTES" Box Entries

Entries made in the "SEARCH NOTES" box are of equal importance to those placed in the "SEARCHED" box; however, these entries will not be printed on any resulting patent. They are intended to complete the application file record of areas and/or documents considered by the examiner in the search. The examiner will record the following searches in the "SEARCH NOTES" box and in the manner indicated, with each search dated and initialled:

1. *A cursory search,* or scanning, of a subclass, i.e., a search usually made to determine if the documents classified there are relevant.
   The classification will be recorded, followed by "(Cursory)."

2. *A consultation* with other examiners to determine if relevant search fields exist in their areas of expertise. The class and subclass discussed, if not actually searched, will be recorded, followed by "(consulted)." This entry may also include the name of the examiner consulted and the art unit.
3. *A search of a publication* not located within the classified patent file, e.g., a library search, a text book search, a Chemical Abstracts search, etc. The following data will be recorded for each type of literature search:
   a. *Abstracting publications,* such as Chemical Abstracts or the Engineering Index—the name of the publication, the list of terms consulted in the index and the period covered will be recorded.
   b. *Periodicals*—The title and period or volumes covered, as appropriate will be recorded.
   c. *Books*—The title and author, edition or date, as appropriate, will be recorded.
   d. *Other types of literature* not specifically mentioned above (i.e., catalogs, manufacturer's literature, private collections, etc.).

   Unless the search is a cursory or browsing one, data as necessary to provide unique identification of material searched will be recorded. Specific materials cited by the examiner will not be recorded again here.
   e. *Computer search in Scientific Library*—An on-line computerized literature searching service which uses key terms and index terms to locate relevant publications in many large bibliographic data bases is available to examiners in the Scientific Library of the Patent and Trademark Office. A member of the library staff is assigned to assist examiners in selecting key terms and to program the search.

   There are two on-line search systems: The Lockheed Information Systems and the SDC Search Service.

   These search systems include many data bases.

   A copy of the search printout will be made and placed in the application file, attached to the right flap of the file jacket.

   The examiner will also indicate which publications were reviewed by initialling and dating the copy of the printout in the left margin adjacent to each reviewed publication. If only an abstract of a document was reviewed, the note of "ck'ed abst." will be made next to the initials and date. If the complete document was reviewed, the note "ck'ed doc." will be placed with the initials and date.
4. A search of only the *publications in a subclass.* The class and subclass followed by "(publications only)" will be recorded.
5. *A review of art cited in a parent application* or in an original patent, as required for all continuing and reissue applications, or a review of art cited in related applications or patents mentioned within the specification, such as those included to provide background of the invention.

   The serial number of a parent application that is still pending or abandoned, followed by "refs. checked" or "refs. ck'ed" will be recorded. If for any reason not all of the references are checked because they are not available or clearly not relevant, such exceptions will be noted.

   The patent number of a parent or related application that was patented or of an original patent now being reissued will be recorded along with the expressions "refs. checked" or "refs. ck'ed."

C. *Not Recorded*

The following data will not be recorded in either of the search boxes, but will be noted in the application file as indicated below.

1. *Citations of prior art by applicants conforming to Rule 98 and the practice thereunder.*
   In each instance where all prior art referred to in a paper placed in the application file is considered, the examiner will place the notation "all ck'ed" and his or her initials adjacent to the citation.
2. *Citations of prior art by applicants not conforming to Rule 98 and the practice thereunder.*
   In each instance where an examiner considers, but does not cite on form PTO–892, specific prior art referred to in a paper placed in the application file, the examiner will place a notation adjacent to the reference. If all the references referred to in such a paper are reviewed, the examiner will place the notation "all ck'ed" and his or her initials adjacent the citation. If included in the specification, the examiner will write his or her initials adjacent to any reference(s) checked and enter "checked" or "ck'ed" in the left margin opposite the initials. If presented in a separate paper or in the remarks of an amendment, the examiner's initials and "checked" or "ck'ed" will be entered adjacent to the citation(s) or wherever possible to indicate clearly those checked.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

Date: 2–22–77.

[956 O.G. 1546]

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(48) "MERE FUNCTION OF MACHINE"—REJECTION

In view of the decision of the Court of Customs and Patent Appeals in *In re Tarczy-Hornoch* appearing at 158 USPQ 141, process or method claims will no longer be subject to a rejection by Patent Office examiners solely on the ground that they define the inherent function of a disclosed machine or apparatus. Accordingly, the subject matter of MPEP 706.03(r) is inapplicable and hereby cancelled.

RICHARD A. WAHL,
Assistant Commissioner.

Feb. 10, 1969.

[861 O.G. 343]

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(49) EXPRESS ABANDONMENTS

Experience over the past several months has indicated the need to clarify and re-emphasize existing practice regarding express abandonments submitted under 37 CFR 1.138.

Since 1966, when Rule 138 was revised, it is no longer required that the applicant and the assignee of record, if any, sign an express abandonment. The revised rule indicates that a patent application may be expressly abandoned by an attorney or agent of record. Therefore, prior to signing a declaration of express abandonment of a patent application, it is imperative that the attorney or agent of record exercise every precaution in ascertaining that the abandonment of the application is in accordance with the desires and best interests of the applicant. Moreover, special care should be taken to insure that the appropriate application from a group of related applications is correctly identified in the letter of abandonment.

A declaration of abandonment signed by the applicant or his attorney or agent of record becomes effective when an appropriate official of the Office takes action in recognition of the declaration. When so recognized, the date of abandonment may be the date of recognition or a different date if so specified in the declaration itself. For example, where a continuing application is filed with a request to abandon the prior application as of the filing date accorded the continuing application, the date of the abandonment of the prior application will be in accordance with the request once it is recognized.

Action in recognition of an express abandonment may take the form of an acknowledgement by the examiner or the Patent Issue Division of the receipt of the express abandonment, indicating that it is in compliance with 37 CFR 1.138 (see Section 711.01 MPEP). Alternatively, recognition may be no more than the transfer of drawings to a new application pursuant to instructions which include a request to abandon the application containing the drawings to be transferred (see 37 CFR 1.60 and Section 608.02(l) MPEP).

It is suggested that divisional applications being submitted under 37 CFR 1.60 be reviewed before filing to ascertain whether the prior application should be abandoned. Recent experience reveals that some divisional applications are being filed under 37 CFR 1.60 with requests to transfer the drawings from, and abandon, the prior application. Following the recognition of the abandonment, the attorney or agent signing the request informs the Office that the request was made

by mistake for any one of a number of reasons. Care should be exercised in situations such as these as the Office looks on express abandonments as acts of deliberation, intentionally performed.

Another common situation involves the submission of an express abandonment following the allowance of an application. The express abandonment may not be recognized unless it is actually received by appropriate officials in time to act before the date of issue. In those cases, once a patent number and issue date have been assigned to the application, it is considered too late to act on the express abandonment unless a petition under Rule 313(b) or Rule 183 is granted (see Section 711.01 of MPEP).

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Apr. 7, 1975.

[934 O.G. 2]

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(50) NOTICE OF ABANDONMENT FOR FAILURE TO PROSECUTE APPLICATION

Effective immediately the Patent Examining Corps will mail a communication, concerning all applications becoming abandoned in the Corps for failure to prosecute, to the correspondence address of record.

The communication to be mailed will merely comprise a copy of the first page of the Office action, to which applicant failed to properly respond, the copy including stamped language thereon indicating that the application has become abandoned and the date that the copy was mailed. The language stamped on the copy will be as follows: APPLICATION HAS BECOME ABANDONED. THIS NOTICE MAILED: ————————. In no case will the mere failure to receive a notice of abandonment affect the status of an abandoned application.

This new procedure should enable applicants to take appropriate and diligent action to reinstate an application inadvertently abandoned for failure to timely respond to an official communication. In most cases, a petition to revive under 37 CFR 1.137 will be the appropriate remedy. It may be that a response to the Office action was mailed to the Office with a certificate of mailing declaration as a part thereof (notice of October 26, 1976; 951 O.G. 1342) but was not received in the Office. In this instance, adequate relief may be available by means of a petition to withdraw the holding of abandoned.

In any instance, if action is not taken promptly after receiving the notice of abandonment, appropriate relief may not be granted.

If a lack of diligent action is predicted on the contention that neither the Office action nor the notice of abandonment was received, one may presume that there is a problem with the correspondence address of record. Accordingly, your attention is directed to recent notices of May 28, 1975, and September 9, 1976, dealing with changes of address (935 O.G. 1352 and 951 O.G. 454). In essence, it is imperative that a paper notifying the Office of a change of address be filed promptly in *each* application in which the correspondence address is to be changed.

If an application is abandoned or a patent lapsed for an excessive time a terminal disclaimer may be required. A terminal disclaimer may also be required where the holding of abandonment or lapse is withdrawn but a determination is made that action attempting to correct the problem should have been taken in a more diligent manner.

WILLIAM FELDMAN,
May 9, 1977. *Deputy Assistant Commissioner for Patents.*

[959 O.G. 24]

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(51) ENVIRONMENTAL QUALITY

In signing the National Environmental Policy Act on the first day of this decade, President Nixon declared, "The 1970's absolutely must be the years when America pays its debt to the past by reclaiming the purity of its air, its waters and our living environment." This landmark legislation declares that it is the continuing policy of the Federal Government to use all practicable means and measures to foster and promote the general welfare, create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans. The Act further directs that, to the fullest extent possible, the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act.

In accordance with the desires of the President and this mandate of the Congress, the Patent Office will accord "special" status to all patent applications for inventions which materially enhance the quality of the environment of mankind by contributing to the restoration or maintenance of the basic life-sustaining natural elements—air, water, and soil. In order that the Patent Office may implement this procedure, we request that all applicants desiring to participate in this program request that their applications be accorded "special" status. Such requests should be written, should identify the applications by serial number and filing date, and should be accompanied by affidavits or declarations under Rule 102 explaining how their inventions contribute to the restoration or maintenance of one of these life-sustaining elements.

WILLIAM E. SCHUYLER, JR.,
Jan. 29, 1970. *Commissioner of Patents.*

[871 O.G. 673]

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(52) APPLICATIONS RELATED TO ENERGY

In his Message of April 18, 1973, to The Congress "Concerning Energy Resources," the President stated that "with 6 percent of the world's population, we consume almost a third of all the energy used in the world." The President noted that our energy demands "now outstrip our available supplies, and at our present rate of growth, our energy needs a dozen years from now will be nearly double what they were in 1970." The President's Message of April 18 called for the development of a more comprehensive, integrated national energy policy and announced specific steps to carry out the policy. On June 29, 1973, the President announced a series of additional actions to deal with the Nation's energy problem. Among those actions were major efforts in energy research and development and in energy conservation.

In order to enhance and further the goals and actions announced by the President, the Patent Office will, on request, accord "special" status to all patent applications for inventions which materially contribute to (1) the discovery or development of energy resources, and (2) the more efficient utilization and conservation of energy resources. Examples of inventions in category (1) would be those relating to further developments in fossil fuels (natural gas, coal, and petroleum), nuclear energy, solar energy, etc. Category (2) would include inventions relating to the reduction of energy consumption in combustion systems, industrial equipment, household appliances, etc. In order that the Patent Office may implement this procedure, we request that all applicants desiring to participate in this program request that their applications be accorded "special" status. Such requests should be written, should identify the application by serial number and filing date, and should be accompanied by affidavits or declarations under rule 102 by the applicant or his attorney or agent explaining how the invention materially contributes to category (1) or (2) set forth above.

Requests should be addressed to the Commissioner of Patents, Washington, D.C. 20231.

RENE D. TEGTMEYER,
Date: Oct. 26, 1973. *Acting Commissioner of Patents.*
Approved:
BETSY ANCKER-JOHNSON, Ph.D.,
Assistant Secretary for Science and Technology.

[916 O.G. 2]

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(53) RECOMBINANT DNA

Accelerated Processing of Patent Applications for Inventions

In recent years revolutionary genetic research has been conducted involving recombinant deoxyribonucleic acid ("re-

combinant DNA"). Recombinant DNA research appears to have extraordinary potential benefit for mankind. It has been suggested, for example, that research in this field might lead to ways of controlling or treating cancer and hereditary defects. The technology also has possible applications in agriculture and industry. It has been likened in importance to the discovery of nuclear fission and fusion. At the same time concern has been expressed over the safety of this type of research. The National Institutes of Health (NIH) has released guidelines for the conduct of research concerning recombinant DNA. "Guidelines for Research Involving Recombinant DNA Molecules," published in the Federal Register of July 7, 1976, 41 F.R. 27902–27943. NIH is sponsoring experimental work to identify possible hazards and safety practices and procedures.

In view of the exceptional importance of recombinant DNA and the desirability of prompt disclosure of developments in the field, the Assistant Secretary of Commerce for Science and Technology has requested that the Patent and Trademark Office accord "special" status to patent applications involving recombinant DNA. Upon appropriate request, the Office will make special patent applications for inventions relating to recombinant DNA, including those that comtribute to safety of research in the field. Requests for special status should be written, should identify the application by serial number and filing date, and should be accompanied by affidavits or declarations under 37 CFR 1.102 by the applicant, attorney or agent explaining the relationship of the invention to recombinant DNA research. Requests also must include a statement that the NIH guidelines cited above or as amended in the future are being followed in any experimentation in this field, except that the statement may include an explanation of any deviations considered essential to avoid disclosure of proprietary information or loss of patent rights. The requests will be handled in the same manner as requests to make applications special that relate to energy or environmental quality. See Manual of Patent Examining Procedure 708.02.

Dated : Jan. 7, 1977.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved : January 10, 1977.

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

[FR Doc.77–1155 ; Filed 1–12–77 ; 8 : 45 am]

[955 O.G. 350]

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(54) RECOMBINANT DNA

Suspension of Accelerated Processing of Patent Applications for Recombinant DNA Research Inventions

On January 10, 1977, the Patent and Trademark Office issued a notice, published in the Federal Register of January 13, 1977, 42 FR 2712–2713, which provided for the accelerated processing of patent applications for inventions relating to Recombinant DNA, including those that contribute to safety of research in the field.

In order that the Federal Interagency Committee for Recombinant DNA Research may consider recommendations concerning research conducted by the private sector in this field, that part of the referenced notice dealing with accelerated processing of patent applications for Recombinant DNA research inventions is suspended until further notice.

That part of the referenced notice dealing with accelerated processing of patent applications relating to safety of research in this field will remain in force.

Dated : March 3, 1977.

RENE D. TEGTMEYER,
Acting Commissioner of Patents and Trademarks.

Approved : March 3, 1977.
BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

[FR Doc. 77–6908 ; Filed 3–8–77 ; 8 : 45 am]

[957 O.G. 8]

(55) NEW PROCEDURES FOR RECORDATION OF INTERVIEWS

This notice establishes within the Patent and Trademark Office additional general procedures for the recordation of interviews. Proposed procedures were published in the OFFICIAL GAZETTE of June 28, 1977 (959 O.G. 36) for comment from interested members of the public by August 10, 1977. Fifteen written comments were received the majority of which were favorable to the proposed procedures. Careful consideration has been given to the comments and the procedures are being adopted with a few changes.

Under present practice it is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability as set forth in Setion 713.04 of the Manual of Patent Examining Procedure (MPEP). This practice is continued and further amplified as set forth below.

Recent surveys have indicated that the substance of many interviews has not been made of record or the text thereof is incomplete as to substantive matters. In some cases, the substance of an interview may be presented as arguments in a subsequent response filed by the applicant but without any indication that they had been presented at the interview. In order to help insure a better record of examiner-applicant interviews in application files, the following new procedures are adopted to become effective for interviews conducted on and after January 1, 1978. Appropriate changes will be made in the Manual of Patent Examining Procedure (MPEP).

Examiners will complete a two-sheet carbon interleaf Interview Summary Form for each interview held where a matter of substance has been discussed by checking the appropriate boxes and filling in the blanks in neat handwritten form. Discussions regarding only procedural matters, directed solely to restriction requirements (for which interview recordation is otherwise provided for in Section 812.01 of the MPEP), or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below.

The Interview Summary Form shall be given an appropriate paper number, placed in the file and listed on the "Contents" list on the file wrapper. The docket and serial register cards will not be updated to reflect this interview. In a personal interview, the duplicate copy of the Form will be removed and given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephonic interview, the copy will be mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner before an allowance is not likely or if other circumstances dictate, the Form will be mailed promptly after the telephonic interview rather than with the next official communication. The original of the completed Form will be made of record and placed in the right hand flap of the file.

The Form provides for recordation of the following information :

— Serial Number of the application
— Name of applicant
— Name of examiner
— Date of interview
— Type of interview (personal or telephone)
— Name of participant(s) (applicant, attorney or agent, etc.)
— An indication whether or not an exhibit was shown or a demonstration conducted
— An identification of the claims discussed
— An identification of the specific prior art discussed
— An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). (Agreements as to allowability are tentative and do not restrict further action by the examiner to the contrary.)
— The signature of the examiner who conducted the interview
— Names of other Patent and Trademark Office personnel present.

The Form also contains a statement reminding the applicant of his responsibility to record the substance of the interview.

It is desirable that the examiner orally remind the applicant of his obligation to record the substance of the interview in each case unless both applicant and examiner agree that the examiner will record same. Where the examiner agrees to record the substance of the interview, or when it is adequately recorded on the Form or in an attachment to the Form, the examiner will check a box at the bottom of the Form informing the applicant that he need not supplement the Form by submitting a separate record of the substance of the interview.

It should be noted, however, that the Interview Summary Form will not be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview:

The complete and proper recordation of the substance of any interview should include at least the following applicable items:

1) A brief description of the nature of any exhibit shown or any demonstration conducted.
2) an identification of the claims discussed.
3) an identification of specific prior art discussed.
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the examiner.
5) a brief identification of the general thrust of the principal arguments presented to the examiner. The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he feels were or might be persuasive to the examiner.
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete or accurate, the examiner will take appropriate action as set forth in MPEP Section 713.04. If the record is complete and accurate, the examiner should place the indication "Interview record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

C. MARSHALL DANN,
Aug. 30, 1977. *Commissioner of Patents and Trademarks.*

[962 O.G. 21]

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(56) STATEMENTS FILED UNDER ATOMIC ENERGY ACT AND NASA ACT

Attention is called to the provisions of section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182) and section 305(c) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457). These statutes provide that the title to inventions useful in the production or utilization of special nuclear material or atomic energy, made or conceived in the course of or under any contract, subcontract, or arrangement entered into with or for the benefit of the Atomic Energy Commission, and any invention made in the performance of any work under any contract of the National Aeronautics and Space Administration, shall be vested in the United States. They also provide that no patent may be granted for any invention useful in the production or utilization of special nuclear material or atomic energy, or which in the opinion of the Commissioner has significant utility in the conduct of aeronautical or space activities, unless the applicant files with his application or within 30 days after request therefor by the Commissioner, a statement under oath setting forth (*a*) the full facts in regard to the making or conception of the invention, and (*b*) the situation with regard to the contractual relationships involving the Commission or the Administration. Careful attention should be given the exact wording of the requirements of whichever of these sections is pertinent in order to assure that all of the requirements are met. Since the duty of requiring the statements is placed by law on the Commissioner of Patents, it is incumbent on the Commissioner to determine whether the statements are timely filed and sufficient in substance to comply. Since these laws do not provide for any extension of the 30-day period or for reviving an application which has become abandoned for failure to file a proper statement, it is important that such statements be timely filed and that they do so comply in order to avoid loss of valuable patent rights.

The "full facts" involved in the conception and making of an invention should include those which are unique to that invention. The use of form paragraphs or printed forms which set forth only broad generalized statements of fact is not ordinarily regarded as meeting the requirements of these statutes.

This office has construed the word "applicant" in both of these statutes to mean the inventor or joint inventors in person. Accordingly, in the ordinary situation, the statements must be signed by the inventor or joint inventors, if available. This construction is consistent with the fact that no other person could normally be more knowledgeable of the "full facts concerning the circumstances under which such invention was made," (42 U.S.C. 2457) or, "full facts surrounding the making or conception of the invention or discovery" (42 U.S.C. 2182).

In instances where an applicant does not have first-hand knowledge whether the invention involved work under any contract, subcontract, or arrangement with or for the benefit of the Atomic Energy Commission, or had any relationship to any work under any contract of the National Aeronautics and Space Administration, and includes in his statement information of this nature derived from others, his statement should identify the source of his information. Alternatively, the statement by the applicant could be accompanied by a supplemental declaration or oath, as to the contractual matters, by the assignee or other person, e.g., an employee thereof, who has the requisite knowledge.

Where an applicant is deceased or incompetent, or where it is shown to the satisfaction of this Office that he refuses to furnish a statement or cannot be reached after diligent efforts, declarations or statements under oath setting forth the information required by the statutes may be accepted from an officer or employee of the assignee who has sufficient knowledge of the facts. The offer of such substitute statements should be based on the actual unavailability of or refusal by the applicant, rather than mere inconvenience. Where it is shown that one of joint inventors is deceased or unavailable, a statement by all of the other joint inventor(s) may be accepted.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.
Aug. 13, 1973.

[914 O.G. 2]

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(57) EXTENSIONS OF TIME TO SUBMIT AFFIDAVITS AFTER FINAL REJECTION

Not infrequently, applicants request an extension of time, stating as a reason therefor that more time is needed in which to submit an affidavit. When such a request is filed after final rejection, the granting of the request for extension of time is without prejudice to the right of the examiner to question why the affidavit is now necessary and why it was not earlier presented. If applicant's showing is insufficient, the examiner may deny entry of the affidavit, notwithstanding the previous grant of an extension of time to submit it. The grant of an extension of time in these circumstances serves merely to keep the case from becoming abondoned while allowing the applicant the opportunity to present the affidavit or to take other appropriate action. Moreover, prosecution of the application to save it from abandonment must include such timely, complete and proper action as required by 37 CFR 1.113. The admission of the affidavit for purposes other than allowance of the application, or the refusal to admit the affidavit, and any proceedings relative thereto, shall not operate to save the application from abondonment.

Implicit in the above practice is the fact that affidavits submitted after final rejection are subject to the same treat-

ment as amendments submitted after final rejection. *In re Affidavit Filed After Final Rejection,* 152 USPQ 292, 1966 C.D. 53.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

July 25, 1977.

[961 O.G. 16]

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(58) TRANSLATIONS OF FOREIGN LANGUAGE REFERENCES

Frequently, Office actions cite references that are in a foreign language. In the event a translation of the entire text or portion of the text of the reference is readily available in the examiners' search files, a copy of the translation will normally be included with the Office action. However, applicants are cautioned that the inclusion of a translation with a foreign language reference should not be construed to mean that the examiner used or relied on the translation, or that it is accurate or an official translation made by the Patent and Trademark Office.

While this service may be infrequent, it could be increased by the submission of translations by the applicant to the Office. Accordingly, it is requested that translations of foreign language references be transmitted to the Office, and in particular be transmitted with the response to the Office action or in a separate envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231. In addition, it would be of great assistance to the Office in filing the translation, if the translation carried the following: 1. an identification of the foreign language reference and, where possible, 2. its location in the examiners' search files (e.g. location should be known if reference was cited in Office action). If identifying information is not available, the incoming translation should carry the name "Scientific Library" thereon so that it can be processed by the Library.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Date: Oct. 26, 1977.

[964 O.G. 24]

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(59) TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

CHAPTER 1—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

PART 1—RULES OF PRACTICE IN PATENT CASES

Patent Examining and Appeal Procedures

On October 4, 1976 notice was given in the Federal Register (41 FR 43729) of a proposal to amend sixteen sections of Title 37 of the Code of Federal Regulations relating to patent examining and appeal procedures. Interested persons were invited to comment on the proposal by December 7, 1976. One hundred seventy-five written letters and statements were submitted. A hearing was held in Arlington, Virginia on December 7, 1976 at which 21 persons testified orally. Careful consideration has been given to all comments received, and the proposal is being adopted with certain changes.

The regulations adopted involve all sections that were proposed to be revised, amended or added—namely, §§ 1.11, 1.14, 1.52, 1.56, 1.65, 1.69, 1.97, 1.98, 1.99, 1.109, 1.175, 1.194, 1.196, 1.291, 1.292, and 1.346. Amendments also are being made in two sections which were not included in the published proposal—§§ 1.51 and 1.176. Since amendments to these sections are closely related to the substance of matters which were contained in the published proposal, separate notice and public comment on these amendments are deemed unnecessary.

In addition, amendments are being adopted which were published for comment in two earlier, much less extensive proposals that concerned availability of certain files for public inspection. A notice of a proposed amendment to § 1.14(b) was published on June 4, 1974 (39 FR 19786). A notice of a proposed amendment to § 1.11(a) was published on September 17, 1974 (39 FR 33376). No negative comments were submitted with respect to either of these proposals and both are being adopted without change.

The text of the rules will be reproduced in the Patent and Trademark Office OFFICIAL GAZETTE in about a month with additions indicated by arrows and deletions indicated by brackets to help readers identify the changes. A transcript of the hearing, the letters and written statements received, and a summary and analysis of the comments are available for public inspection in Room 11E10 of Crystal Plaza Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia.

PURPOSE OF RULES

The purpose of the rules that are being adopted is to improve the quality and reliability of issued patents by strengthening patent examining and appeal procedures. It is desirable that patents be as dependable as possible, so as to enhance the incentives provided by the patent system to make inventions, to invest in research and development, to put new or improved products on the market, and to disclose inventions that otherwise would be kept as trade secrets. It is believed that the rules being adopted will help to maintain strong patent incentives.

The rules afford patent owners an opportunity, through the filing of a reissue application, to obtain a ruling from an examiner on the pertinence of additional prior art after a patent has been issued. The rules also broaden the public's opportunity for participation in the patent examining process, consistent with the limitations of statute, the protection of trade secrets, and the need to avoid making it unduly expensive to obtain a patent.

The rules set forth the duty of candor and good faith which applicants have to the Patent and Trademark Office and encourage them to provide information about the prior art in a way that will make it more useful to examiners. A provision for foreign language oaths by individuals who do not understand English is intended to make them more aware of their representations and of their obligations.

Under the rules more Patent and Trademark Office decisions that could have important precedent value will be available to the public, and some additional files will be available for inspection. Proceedings before the Board of Appeals are modified to help avoid the issuance of invalid patents. The rules encourage examiners to see that persons inspecting the file history of issued patents will be able to tell why the case was allowed.

REISSUE APPLICATIONS

Amended § 1.175 permits a patent owner to have new prior art considered by the Office by way of a reissue application without making any changes in the claims or specification. It is adopted with no change from the proposal. The requirement for an oath or declaration alleging that the reissue applicant believes "the original patent to be wholly or partly inoperative or invalid. . . ." is dispensed with in § 1.175(a)(1) unless the applicant believes that to be the case. Section 1.175(a)(4) recognizes that reissues may be filed to have the patentability of the original patent considered in view of prior art or other information relevant to patentability which was not previously considered by the Office.

Thus, a patentee may file a reissue if he believes his patent is valid over prior art not previously considered by the Office but would like to have a reexamination. The procedure may be used at any time during the life of a patent. During litigation, a federal court may, if it chooses, stay proceedings to permit new art to be considered by the Office.

If a reissue application is filed as a result of new prior art with no changes in the claims or specification and the examiner finds the claims patentable over the new art, the application will be rejected as lacking statutory basis for a reissue, since 35 USC 251 does not authorize reissue of a patent unless it is deemed wholly or partly inoperative or invalid. However, the record of prosecution of the reissue will indicate that the prior art has been considered by the examiner.

A substantial majority of the comments received favored amended § 1.175 as a means for improving the reliability of patents and avoiding unnecessary litigation costs. The negative comments generally questioned the statutory authority of the Commissioner to adopt this section. Authority for § 1.175 is believed to exist in 35 U.S.C. 6, which is the Commissioner's rulemaking authority, and in 35 U.S.C. 251. The latter section of the statute requires that the patent be deemed wholly or partly inoperative or invalid before a reissue may be granted, but does not require such a belief by

the patentee before a reissue application may be filed. The case law does not suggest that the approach of new § 1.175(a)(4) is inconsistent with 35 U.S.C. 251.[1] Inasmuch as 35 U.S.C. 251 is a remedial provision,[2] it is believed that a liberal interpretation is justified and that adequate authority exists for the amended section.

Amended § 1.11(b) opens all reissue applications to inspection by the general public. Section 1.11(b) also provides for announcement of the filings of reissue applications in the OFFICIAL GAZETTE. This announcement will give interested members of the public an opportunity to submit to the examiner information pertinent to patentability of the reissue application. The announcement will include at least the filing date, reissue application and original patent numbers, title, class and subclass, name of the inventor, name of the owner of record, name of the attorney or agent of record, and examining group to which the reissue application is assigned. Section 1.11(b) is amended from the proposal to so indicate. Reissue applications already on file on the effective date of the section will not be automatically open to inspection and will not be announced in the OFFICIAL GAZETTE. However, a liberal policy will be followed in granting petitions for access to individual applications already on file.

In order that members of the public may have time to review the reissue application and submit pertinent information to the Office before the examiner's action, § 1.176 is amended to provide that reissue applications will not be acted on sooner than two months after the OFFICIAL GAZETTE announcement of filing.

A substantial majority of the comments received favored adoption of § 1.11(b). The only opposition was based upon a suggestion that no statutory authority exists. However, since reissue applications contain no new disclosure, and therefore no trade secrets or confidential information, they are considered to present a "special circumstance" within the meaning of 35 U.S.C. 122.

The insertion of "all" as the fifth word of the first sentence of § 1.11(b) is for clarity. The word "furnished" is changed to "obtained" in § 1.11 for clarity.

PROTESTS AND PUBLIC USE PROCEEDINGS

Amended §§ 1.291 and 1.292 give greater recognition to the value of written protests and public use petitions in avoiding the issuance of invalid patents.

A substantial majority of the comments favored these sections and viewed them as improving the quality of issued patents. Entry of protests has been upheld in court.[3]

Section 1.291(a) provides that public protests against pending applications will be entered in the application file and will, if they meet stated requirements, be considered by the examiner. To guarantee consideration by the examiner, protests must be accompanied by copies of prior art documents relied upon, although protests without copies will not necessarily be ignored. This is similar to the requirement of new § 1.98 that copies of patents and publications accompany prior art statements. Section 1.291 does not contemplate permitting a protester to participate as a party in further proceedings. In the case of applications available to the public, such as reissue applications, the protester may file papers rebutting statements made by the applicant. The examiner at his discretion may request a protester to sumit additional written information or may provide extra time for comments by a protester to be filed.

To ensure consideration by the examiner, all protests must be timely submitted. Protests will generally be considered timely submitted, if they are filed before final rejection or allowance of the application by the examiner. The consideration given to protests filed after final rejection or allowance of the application by the examiner will depend upon the relevance of the prior art documents submitted and the point in time at which they are submitted. Obviously, if the prior art documents anticipate or clearly render obvious one or more claims they will not knowingly be ignored. It must be recognized, however, that the likelihood of consideration by the examiner decreases as the patent date approaches. Accordingly, protests must be filed early in order to ensure their consideration.

The first sentence of § 1.291(a) is deleted as unnecessary. Section 1.291(a) also is changed from the proposal to make clear that it applies to pending applications and that all protests will be referred to the examiner having charge of the subject matter involved.

Section 1.291(b) incorporates the existing Office policy of permitting persons to submit prior art citations or copies of prior art after a patent has been granted. The section is changed from the proposal by the addition of the words "any papers related thereto" to recognize that statements as to the pertinence of prior art may be submitted. Both the citations and the related papers are to be entered without comments. The material submitted is not examined by the Office but is available to members of the public inspecting Office records.

Some suggestions were received for major modifications of § 1.291. It was suggested that an advisory opinion of the examiner be placed in the patent file when protests were received after issuance of the patent. Several persons supported a suggestion for examiners to state whether a "new issue" was raised by prior art cited by a protester. Another suggestion was that a procedure similar to that used in the recent Trial Voluntary Protest Programs[4] be adopted on a continuing basis. These suggestions were carefully considered, but are not adopted. The suggestions extend substantially beyond § 1.291 as proposed, and their benefits do not appear sufficient to justify the added cost at this time.

Materials submitted to the Office under §§ 1.291 and 1.292 are to be served upon the applicant, patentee, attorney or agent when possible. The term "patentee" is used in its ordinary sense as defined in 35 USC 100(d). If service is not possible, materials are to be submitted in duplicate so that the Office can attempt to send the duplicate copy. The proposal is changed by adding the words "with the Office" after "filed" in §§ 1.291(c) and 1.292(b) for clarity.

In § 1.292, the requirement that petitioner bear the Office's expenses in conducting the public use proceeding is deleted. Section 1.292 is also amended to ensure that the existence of public use proceedings is recorded in the application file wrapper. Notice of a petition for a public use proceeding will be entered in the file in lieu of the petition itself when the petition and the accompanying papers are too bulky to accompany the file. Any public use papers not physically entered in the file will be publicly available whenever the application file wrapper is available.

DUTY OF DISCLOSURE

Amended § 1.56 defines the duty to disclose information to the Office and the criteria for striking an application when that duty is violated. The wording of the section is changed in several respects from the proposal, but the purpose and general scope are the same as in the proposal. The section codifies the existing Office policy on fraud and inequitable conduct, which is believed consistent with the prevailing case law in the federal courts. The expanded wording of the section is intended to be helpful to individuals who are not expert in the judicially developed doctrines concerning fraud. The section should have a stabilizing effect on future decisions in the Office and may afford guidance to courts as well.

A majority of comments received favored § 1.56 as proposed or with modifications. Persons opposed expressed concern over the imprecise definition of the duty of disclosure and the possibility that the proposal would substantially increase the burden on patent applicants. Some stated that there would be increased litigation as a result of the proposal. Several suggestions were received on better ways to define the individuals who should disclose information and the kinds of information that should be disclosed.

The first sentence of § 1.56(a) is changed from the proposal by adding the word "substantively," so that individuals having a duty of disclosure are limited to those who are "substantively involved in the preparation or prosecution of the application." This change is intended to make clear that the duty does not extend to typists, clerks, and similar personnel who assist with an application. This phrase, when taken with the last sentence of § 1.56(a), is believed to

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[1] See *In re Clark*, 522 F.2d 623, 187 USPQ 209 (CCPA 1975), at footnote 4 where the court declined to decide whether it is proper to seek reissue merely to disclose uncited prior art. See also *In re Altenpohl*, 500 F.2d 1151, 183 USPQ 38 (CCPA 1974).

[2] See *In re Oda*, 443 F. 2d 1200, 170 USPQ 268 (CCPA 1971).

[3] *International Paper Co.* v. *Fibreboard Corp.*, 63 F.R.D. 88, 181 USPQ 740 (D. Del. 1974).

[4] 923 O.G. 2; 930 O.G. 1454; 938 O.G. 945.

provide an adequate indication of the individuals who are covered by the duty of disclosure. The word "with" is inserted in the first sentence of § 1.56(a) before "the assignee" and before "anyone to whom there is an obligation to assign" to make clearer that the duty applies only to individuals, not to organizations.

Numerous comments concerned the term "relevance" that was used in the proposal. In response to the comments, language is substituted in § 1.56 and related sections which is believed to establish a clearer standard for determining whether information need be disclosed to the Office. "Relevant" is replaced by "material" because the latter term connotes something more than a trivial relationship. It appears to be more commonly used in court opinions. In addition, the third sentence of § 1.56, which defines materiality, is rewritten. The sentence now states that information is material "where there is a substantial likelihood that a reasonable examiner would consider it important in deciding whether to allow the application to issue as a patent." The sentence paraphrases the definition of materiality used by the Supreme Court in its recent decision in *TSC Industries* v. *Northway*.[5] Although in that case the court was concerned with rules promulgated by the Securities and Exchange Commission, the Court's articulation of materiality is believed consistent with the prevailing concept that has been applied by lower courts in recent patent cases.

The definition of materiality in § 1.56 will have to be interpreted in the context of patent law rather than securities law. Principles followed by courts in securities cases should not be translated to patent cases automatically. It is noteworthy, however, that in formulating the definition of materiality in *TSC Industries* the Supreme Court considered some of the same matters over which concern was expressed in the public comments on proposed § 1.56. The Court noted that the standard of materiality should not be so low that persons would be "subjected to liability for insignificant omissions or misstatements," or so low that the fear of liability would cause management "simply to bury the shareholder in an avalanche of trivial information—a result that is hardly conducive to informed decision making."[6]

Although the third sentence of § 1.56(a) refers to decisions of an examiner, it is intended that the duty of disclosure would apply in the same manner in the less common instances where the official making a decision on a patent application is someone other than an examiner—e.g., a member of the Board of Patent Interferences or the Board of Appeals. This is implicit in the duty "of candor and good faith" toward the Office that is specified in the first sentence of § 1.56(a).

Comments and questions were received concerning the term "information" used in the second and third sentences of § 1.56(a) and elsewhere. It means all of the kinds of information required to be disclosed under current case law. In addition to prior art patents and publications, it includes information on prior public uses, sales, and the like. It is not believed practicable to define information in the text of the rule at this time. However, the rule is not intended to require disclosure of information favorable to patentability—e.g., evidence of commercial success of the invention. Neither is it meant to require disclosure of information concerning the level of skill in the art for purposes of determining obviousness.

Several comments were received concerning the duty to disclose information the patent applicant regards as confidential, including information the applicant has received from another party under an injunction of secrecy. This problem has existed prior to amendment of § 1.56. The Patent and Trademark Office, of course, keeps information disclosed by applicants confidential until a patent is issued. It has been suggested that the Office should develop a mechanism for continuing to hold information in confidence after issuance of a patent if in the judgment of the examiner the information is not material to the examination of the application. The feasibility of offering a rule for public comment on this topic at a later date will be considered.

New § 1.56(b) is added to make clear that information may be disclosed to the Office through an attorney or agent of record or through a pro se inventor, and that other individuals may satisfy their duty of disclosure to the Office by disclosing information to such an attorney, agent or inventor. Information that is not material need not be passed along to the Office.

Proposed sections 1.56 (b) and (c) have been revised and shortened and appear at §§ 1.56 (c) and (d). The proposal was criticized for leaving it open to the Office to apply a different standard of materiality from the one set forth in § 1.56.[7] Section 1.56(d) as adopted states that an application "shall" be stricken when the criteria set forth are met. Thus § 1.56(d) as adopted establishes a single standard for striking applications.

The term "inequitable conduct" is dropped from § 1.56(d) as covering too great a spectrum of conduct to be subject to mandatory striking. Inequitable conduct that is equivalent to fraud is intended to come within the definition of fraud. The Court of Customs and Patent Appeals already has interpreted "fraud" in existing § 1.56 to encompass conduct of this sort.[8] Moreover, § 1.56(d) as adopted calls for striking an application either for fraud or for a violation of the duty of disclosure.

In § 1.56(d) "bad faith" is substituted for the term "deliberate" that was used in the proposal. This change is to make clear than an intent to deceive (or gross negligence equivalent to such an intent) must be shown before an application will be stricken. Bad faith is not present if information is withheld as a result of an error in judgment or inadvertence.

Several comments concerned whether attorneys and agents could represent their clients' interests and at the same time comply with § 1.56. Similar comments were directed to §§ 1.97 to 1.99. It is of course in the interest of the client to have a valid patent and this cannot be obtained without disclosure of known material facts. It is not inconsistent for an attorney or agent to fulfill his duty of candor and good faith to the Office and to act as an advocate for his client. The submission of information under § 1.56 does not preclude the submission of arguments that such information does not render the subject matter of the application unpatentable.

In § 1.65 a new third sentence is added to require the patent applicant to acknowledge the duty of disclosure. The language is changed from the proposal to be consistent with changes made in § 1.56. To allow time for the Office and applicants to revise printed oath and declaration forms now in use, the mandatory acknowledgement of the duty of disclosure in amended § 1.65 does not become effective until January 1, 1978. Applicants at their option may include the new language in oaths and declarations filed prior to the effective date. The Office will publish a separate notice in the Federal Register adding a sentence acknowledging the duty of disclosure to appropriate forms in 37 CFR Part 3, "Forms for Patent Cases."

The word "statement" is deleted from the title of § 1.65 to avoid confusion with the prior art statement of §§ 1.97 through 1.99.

Amended § 1.346 emphasizes that there must be a reasonable basis to support every allegation of improper conduct made by a registered practitioner in any Office proceeding. The language that was proposed is clarified in the section as adopted. Although § 1.346 is limited to papers filed in Office proceedings, the amendment to § 1.346 is not intended to imply that disciplinary action never will be taken against a registered practitioner under § 1.348 for a groundless allegation of improper conduct in a court proceeding.

PRIOR ART STATEMENT

New §§ 1.97, 1.98 and 1.99 deal with prior art statements and provide a mechanism by which patent applicants may comply with the duty of disclosure provided in § 1.56. The sections have been substantially changed from the proposal, in response to comments received.

Unlike the corresponding part of the proposal, the sections as adopted are not mandatory, though applicants are strongly encouraged to follow the procedures described in them. Applications will be examined whether or not a prior art state-

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[5] 426 U.S. ——, 48 L. Ed. 2d 757, 96 S. Ct. 2126, 44 U.S.L.W. 4852, decided June 14, 1976.

[6] 426 U.S. at——, 48 L. Ed. 2d at 765, 96 S. Ct. at 2132, 44 U.S.L.W. at 4855.

[7] See discussion accompanying proposed rules in Federal Register of October 4, 1976, page 43731, first sentence.

[8] *Norton* v. *Curtiss*, 433 F. 2d 779, 792, 167 USPQ 532, 543 (CCPA 1970).

ment is filed and whether it complies with the rules or is defective. It is nevertheless believed that applicants will find that the use of prior art statements complying fully with the requirements of §§ 1.97 through 1.99 will be the best way to satisfy the duty of disclosure. The Patent and Trademark Office cannot assure that prior art disclosed in other ways will be considered by the examiner.

Sections 1.97 through 1.99 do not prescribe the content of what materials should be submitted in the prior art statement; this is for the applicant and the attorney or agent to decide in the light of the duty of disclosure expressed in § 1.56. The only criterion contained in §§ 1.97 through 1.99 as to content of the art cited is in § 1.97(b). This subsection indicates that the statement will be construed as a representation that the prior art listed includes what the submitter considers to be the closest art of which he is aware. The submitter need not decide which particular items of prior art are the closest or identify any items as such; the representation is simply that he is not withholding known prior art which he considers closer than that which is submitted. Section 1.97(b) makes clear that the prior art statement is not a representation that a search has been made or that no better art exists.

In § 1.97(a) the time for filing the prior art statement is extended from the two months of the original proposal to three months. In most cases prior art submitted within three months will be available to the examiner before he takes up the case for action, though it will be helpful if citations are made as promptly as possible.

Section 1.98 lists the elements of the prior art statement: a listing of the art, a concise explanation of the relevance of each listed item, and copies of the art or the pertinent portions thereof.

The prior art statement resembles somewhat the "patentability statement" of the proposal and the "patentability brief" proposed elsewhere.[9] The name has been changed to reflect a change in the requirements of § 1.98(a). Unlike the proposed version of this paragraph, which called for an explanation of why the claimed invention is believed patentable over the cited art, the paragraph as adopted calls only for a concise explanation of the relevance of each listed item. This may be nothing more than identification of the particular figure or paragraph of the patent or publication which has some relation to the claimed invention. It might be a simple statement pointing to similarities between the item of prior art and the claimed invention. It is permissible but not necessary to discuss differences between the prior art and the claims. It is thought that the explanation of relevance will be essentially as useful to the examiner as the formerly proposed explanation of patentability, and should be significantly less burdensome for the applicant to prepare.

Section 1.98 requires a copy of each patent or publication cited, including U.S. patents, to accompany the prior art statement. Several comments questioned the need for burdening the applicant to supply copies of materials that are present in the Office's files. However, substantial time and effort often is needed to locate a document in the Office's files. Since the person submitting the prior art statement generally has available a copy of the item being cited, it is believed that expense and effort can be minimized by having that person supply the copy in all cases. Consideration has been given to proposals to allow the applicant to submit an order for copies of the patents along with his statement instead of actually submitting copies. This will be further studied, but to date no way has been found to assure that the copies will be available to the examiner by the first action unless the applicant submits them with the prior art statement.

Other changes to §§ 1.97 through 1.99 from the proposal eliminate unnecessary language and clarify the requirements.

A notice published in 1974[10] contained guidelines for the citation of prior art by applicants. Many of those guidelines are repeated or superseded by §§ 1.97 through 1.99. In order to allow applicants, attorneys and agents time to adjust their procedures to comply with the requirements for prior art statements, the effective date of §§ 1.97 through 1.99 will be July 1, 1977. Until these new sections become effective, applicants should continue to follow the 1974 guidelines. Issuance of a revised notice, to take effect July 1, 1977, is under study.

A survey conducted by the Office in 1976 concludes that many applicants have not been citing prior art to the Office.[11] It is hoped that with the duty of disclosure expressly set forth in § 1.56, applicants will perceive that it is to their advantage to use the procedures of §§ 1.97 through 1.99.

Section 1.51 is amended by designating the existing rule as § 1.51(a) and adding new § 1.51(b) which contains a reference to §§ 1.97 through 1.99.

FOREIGN LANGUAGE OATHS

Amended § 1.52 and new § 1.69 are adopted as proposed.

Section 1.69 requires that oaths and declarations be in a language which is understood by the individual making the oath or declaration, i.e., a language which the individual comprehends. If the individual comprehends the English language, he must use it. If the individual cannot comprehend the English language, any oath or declaration must be in a language which the individual can comprehend. If an individual uses a language other than English for an oath or declaration, the oath or declaration must include a statement that the individual understands the content of any documents to which the oath or declaration relates. If the documents are in a language the individual cannot comprehend, the documents may be explained to him so that he is able to understand them.

The Office will provide approved translations for as many of the oath or declaration forms which appear in Part 3 of Title 37 of the Code of Federal Regulations as practicable, and in as many languages as practicable, probably using a side-by-side English/foreign language format. The availability of the foreign language forms will be announced in the OFFICIAL GAZETTE at a later date.

The change in § 1.52, providing for an exception to the requirement that oaths and declarations be in the English language, is necessitated by the adoption of § 1.69.

Although very few persons opposed §§ 1.52 and 1.69, several suggested that the philosophy behind the change be extended to the specification, requiring the specification to be in a language which the applicant understands, accompanied by an English translation. This suggestion was not considered feasible because of the obvious burdens on the applicant and the danger to the applicant and the public if the translation is not literally correct. Also, if a large number of applications were filed in a foreign language, there would be significant administrative burdens on the Office. Attention is directed to the Manual of Patent Examining Procedure, § 608.1, which permits non-English language applications to be filed in certain limited circumstances.

Other suggested modifications of the proposed rule included: (1) using an English language oath or declaration with one additional clause in a language understood by the person making the oath or declaration, the clause stating that the person understands all the documents to which the oath or declaration relates; and (2) extending the two month grace period for filing an English translation of an oath or declaration filed under § 1.65.

After due consideration, suggestion (1) was believed not to accomplish the objectives of the rule as well as the adopted rule. Suggestion (2) would cause unsatisfactory delays in the initial processing of applications.

DECISIONS AND FILES MADE PUBLIC

Section 1.14(d) makes more explicit the conditions under which significant decisions of the Patent and Trademark Office will be made available to the public, and includes reference to decisions of the Board of Patent Interferences, in addition to decisions of the Board of Appeals and the Commissioner.

A large majority of the comments received were favorable. Several commentators felt that more decisions would be made available as a result of the proposed section and that it would assist in publicizing aspects of Office procedure which may not have been available previously.

Some negative comments were based on the view that the Freedom of Information Act[12] required all decisions of the

[9] E.g., Federal Register of September 9, 1968, 34 FR 14176, 866 O.G. 1402; S. 2255, 94th Congress, § 131(b).
[10] Notice of August 12, 1974, 926 O.G. 2.
[11] BNA's Patent, Trademark and Copyright Journal, No. 301, October 28, 1976, page D–1.
[12] 5 USC 552.

Office to be made publicly available. A greater number of those oposing the proposed section, however, felt that applicants should have an absolute right to have their applications maintained in confidence and that no information should be made public without specific authorization from them. One commentator felt that rulemaking on this subject should be deferred until currently pending litigation[13] under the Freedom of Information Act was finally resolved.

The section as adopted is applicable to decisions deemed by the Commissioner to involve an interpretation of patent laws or regulations that would be of significant precedent value, where such decisions are contained in either pending or abandoned applications or in interference files not otherwise open to the public. It is applicable whether or not the decision is a final decision of the Patent and Trademark Office.

The parenthetical phrase in the first sentence of the proposed section, which cited other provisions of the rules under which decisions are open to public inspection, is deleted as unnecessary and possibly confusing. Also, in view of several comments received, the period of time during which an applicant or party in interest may object to having a decision made public is extended from one month to two months. At least twenty days is given to request reconsideration and seek court review before a decision is made public over an objection.

Section 1.14(d) is considered to place a duty on the Patent and Trademark Office to identify significant decisions and to take the steps necessary to inform the public of such decisions, by publication of such decisions, in whole or in part. It is anticipated, however, that no more than a few dozen decisions per year will be deemed of sufficient importance to warrant publication under the authority of this section.

Amended § 1.14(b) allows public inspection of abandoned applications referred to in defensive publications. The comments received on the proposed amendment on this topic in 1974 expressed no opposition and the proposal is adopted without change.

The amendment is intended to encourage use of the defensive publication program provided under § 1.139. The objective of that program is to make available to the public the technical disclosure of applications in which the owner prefers to publish an abstract in lieu of obtaining an examination. Existing §§ 1.11(b) and 1.139 open the complete defensive publication application to inspection by the general public upon publication of the abstract. With the amendment, an abandoned application referred to in a defensive publication application will likewise be open to public inspection, avoiding any need to repeat its contents in the defensive publication application. Thus, public availability of the applications involved should be of benefit both to the applicant and the public.

A suggestion was made that the section be extended still further to include abandoned applications referred to in foreign patents. This suggestion, however, goes too far beyond the proposal that was published and has too uncertain an impact to be adopted at this time.

Amended § 1.11(a) provides earlier access to the file of an interference which involved a patent or an application on which a patent has issued. All comments that were submitted on the 1974 proposal on this topic were favorable and two commentators felt the proposal should be extended further. The proposal is being adopted without change.

Under present practice, access to the file of an interference is not permitted until judicial review of the decision of the Board of Patent Interferences has been exhausted. The amended section allows access to the file after final decision of the Board of Patent Interferences if that decision is an award of priority as to all parties. It is believed that such earlier access will be of benefit to members of the public by making available information relevant to the issuance of the patent whether or not the interference decision is still being adjudicated.

PATENT APPEALS

Section 1.194 clarifies the circumstances in which oral hearings should be requested, provides for oral arguments by or on behalf of examiners in certain appeals and reduces the time permitted for oral arguments.

Comments relating to this section were favorable by a very substantial majority, although there were several reservations to the effect that § 1.194(a) tended to discourage or downgrade oral arguments. Participation by examiners was considered to be desirable not only from the standpoint of improving the overall presentation of the argument, particularly in complex cases, but also for the educational and experience benefits to the examiners themselves.

The only opposition to the section was based on the feeling that oral hearings would be discouraged. The rule is intended to discourage oral hearings only to the same extent as the Office's 1975 Official Gazette notice on the subject.[14] Section 1.194(a) indicates that oral hearings should not be requested as a matter of course in every appeal, but only in those circumstances where the appellant feels that such a hearing will be of material assistance to the proper presentation of the appeal. The section expressly provides that equal consideration will be accorded in deciding all appeals, whether or not an oral hearng is held.

In appeals where the appellant has requested an oral hearing, § 1.194(b) provides for oral argument by, or on behalf of, the primary examiner, if such argument is considered to be helpful by either the primary examiner or the Board. This provision incorporates the present practice of permitting examiners to present an oral argument before the Board.[15] It gives the Board additional discretionary authority to request presentation of an oral argument by, or on behalf of the examiner to ensure that all issues are fully and accurately presented.

Section 1.194(c) provides, as does existing § 1.194, that appeals will be assigned for consideration and decision without an oral hearing where none has been requested by the appellant. Where an oral hearing has been requested, a day of hearing will be set, and both appellant and the primary examiner will be notified. A provision for notice to the examiner is added to the proposed version. Additionally, § 1.194(c) reflects the present practice of limiting oral argument on behalf of the appellant to twenty minues.[16] The time permitted for argument by the examiner has been shortened from twenty minutes, as proposed, to fifteen minutes. The examiner, unlike the appellant, will not ordinarily need time to present the facts of the case or for rebuttal.

In any appeal where oral argument is to be presented by, or on behalf of, the primary examiner, the appellant will be given due notice of that fact.

Proposed § 1.196(b) would have authorized the Board of Appeals to reject allowed claims, in cases before it, whenever the Board had knowledge of grounds for so doing.

While a majority of those commenting on this section favored in principle the concept of allowing the Board to have this right, significant concern was voiced that there was no statutory authority for the Board to actually reject allowed claims. Further, the question of proper authority for judicial review of such action by the Board was a matter of concern. Other reasons advanced in opposition to the section were that applicants would be inhibited from appealing by the risk of having allowed claims rejected and that the proposal would create a higher presumption of validity in cases reviewed by the Board. A significant number commented that it would be more appropriate for the Board to remand the case to the primary examiner for consideration of the grounds raised by the Board. This would afford the applicant an opportunity to demonstrate the patentability of the claims and would remove any question as to statutory authority.

In view of the comments received, existing § 1.196(b) will not be modified, but a new § 1.196(d) is added providing express authority for the Board of Appeals to include, in its decision, a statement of any grounds for rejecting any allowed claim that it believes should be considered by the primary examiner. Section 1.196(d) provides that the Board may remand the case to the examiner for such consideration, and that the applicant shall have an opportunity to respond to the grounds set forth by the Board prior to consideration, by the examiner. If the previously allowed claims are rejected by the examiner, the rejection may be appealed to the Board.

The new section further provides that a decision of the Board which includes a remand will not be considered as a

[13] *Irons* v. *Gottschalk*, Slip Opinion, No. 74–1365 (D.C. Cir., October 21, 1976).

[14] See notice of March 20, 1975, 933 O.G. 1010.

[15] MPEP, § 1209.

[16] See notice of March 20, 1975, 933 O.G. 1010.

final decision in the case, but that the Board, following conclusion of the proceedings before the primary examiner, will either adopt its earlier decision as final or will render a new decision based on all appealed claims, as it considers appropriate. In either case, final action by the Board will give rise to the existing alternatives available to an appellant following a decision by the Board.

In situations where the primary examiner concludes after consideration of all the evidence and argument that the remanded claims should be allowed, the new rule dealing with reasons for allowance (§ 1.109) provides an appropriate mechanism for him to explain, on the record, his reasoning for coming to this conclusion, notwithstanding the grounds set forth by the Board in its statement.

Promulgation of new § 1.196(d) does not affect the Board's existing authority to remand a case to the primary examiner without rendering a decision in appropriate circumstances. Section 1.196(d) is not intended as an instruction to the Board to reexamine every allowed claim in every appealed application. It is, rather, intended to give the Board express authority to act when it becomes apparent, during the consideration of rejected claims, that one or more allowed claims may be subject to rejection on either the same or on different grounds from those applied against the rejected claims.

REASONS FOR ALLOWANCE

New § 1.109 is intended to emphasize and formalize the examiner's authority to state his reasoning for allowing a claim or claims. The authority is discretionary with the examiner and is only to be used when the record does not otherwise reveal the reasons for allowance.

A majority of the comments received favored the rule as proposed because it would tend to provide courts and others who were reviewing the patent with a clearer record. Those who opposed the rule most often gave the reason that the examiner might fail to state all the reasons or the strongest reasons why a claim was allowed, which could place unnecessary limitations on the claims or create an estoppel in subsequent litigation or licensing.

To help insure that the examiner's statement of his reasoning in allowing a claim will not unnecessarily limit the claims or create an estoppel, a final sentence is added to the proposal which states that failure of the applicant to comment upon or rebut the examiner's reasoning "shall not give rise to any implication that the applicant agrees with or acquiesces in the reasoning of the examiner."

Several commenters suggested that stricter enforcement of §§ 1.111 and 1.133 would eliminate the need for a new rule concerning reasons for allowance. Situations exist, however, where a statement of reasons for allowance could be helpful, for example when an examiner withdraws a rejection for reasons not suggested by the applicant; when an applicant submits several arguments for allowing a claim and the examiner finds not all of them persuasive; when an examiner allows a claim on the first Office action after citing very close prior art; and when the examiner allows a claim after remand from the Board of Appeals (see new § 1.196(d)).

The first sentence of the proposed rule is changed to define more precisely the circumstances in which an examiner's statement is appropriate, as well as to define more precisely the content of the statement. The statement will include the examiner's "reasoning." The examiner may state his reasoning whenever he "believes that the record of the prosecution as a whole does not make clear his reasons for allowing a claim or claims."

Several persons commented that the rule should provide a procedure for appeal from the examiner's statement of his reasoning. The rule does permit applicants to comment upon the examiner's reasoning. If the applicant does not wish to comment, he may reserve for a later proceeding, without prejudice, any rebuttal.

TEXT OF RULES ADOPTED

After consideration of the comments received and pursuant to the authority contained in § 6 of Title 35 of the United States Code, Part 1 of Title 37 of the Code of Federal Regulations is amended as set forth below.

1. Section 1.11 is revised to read as follows:

§ 1.11 *Files open to the public.*

(a) After a patent has been issued, the specification, drawings, and all papers relating to the case in the file of the patent are open to inspection by the general public, and copies may be ►obtained◄ [furnished] upon paying the fee therefor. ►After an award of priority by the Board of Patent Interferences as to all parties, the file of any interference which involved a patent, or an application on which a patent has issued,◄ [The file of any terminated interference involving a patent, or an application on which a patent has subsequently issued,] is similarly open to public inspection and procurement of copies. See § 2.27 for trademark files.

(b) ►All reissue applications and all applications◄ [Applications] in which the Office has accepted a request filed under § 1.139 ►,and related papers in the application file,◄ are open to inspection by the general public, and copies may be ►obtained◄ [furnished] upon paying the fee therefor. ►The filing of reissue applications will be announced in the OFFICIAL GAZETTE. The announcement shall include at least the filing date, reissue application and original patent numbers, title, class and subclass, name of the inventor, name of the owner of record, name of the attorney or agent of record, and examining group to which the reissue application is assigned.◄

2. In § 1.14 paragraphs (b) and (d) are revised to read as follows:

§ 1.14 *Patent applications preserved in secrecy.*

* * * * *

(b) Except as provided in § 1.11(b) abandoned applications are likewise not open to public inspection, except that if an application referred to in a U.S. patent ►, or in an application which is open to inspection pursuant to § 1.139,◄ is abandoned and is available, it may be inspected or copies obtained by any person on written request, without notice to the applicant. Abandoned applications may be destroyed after 20 years from their filing date, except those to which particular attention has been called and which have been marked for preservation. Abandoned applications will not be returned.

* * * * *

(d) ►Any decision of the Board of Appeals or the Board of Patent Interferences, or any decision of the Commissioner on petition,◄ [Selected decisions of the Board of Appeals, or of the Commissioner, in abandoned applications] not otherwise open to public inspection ►shall◄ [(paragraph (b) of this section) may] be published or made available for ►public inspection if: (1) The Commissioner believes the decision involves an interpretation of patent laws or regulations that would be of important precedent value; and (2) the applicant, or any party involved in the interference, does not, within two months after being notified of the intention to make the decision public, object in writing on the ground that the decision discloses a trade secret or other confidential information. If a decision discloses such information, the applicant or party shall identify the deletions in the text of the decision considered necessary to protect the information. If it is considered the entire decision must be withheld from the public to protect such information, the applicant or party must explain why. Applicants or parties will be given time, not less than twenty days, to request reconsideration and seek court review before any portions of decisions are made public over their objection.◄ [publication at the Commissioner's discretion, unless the applicant timely presents sufficient reasons for not doing so. The applicant will be notified, through the attorney of record in the application file, when it is proposed to release such a decision and a time not less than thirty days set for presenting any such reasons. The fact that the subject matter of the application has not been made public in any manner, or that the same subject matter is being prosecuted in a pending application, will be considered sufficient reason for not releasing the decision if the applicant so requests unless the text of the decision contains no description of such subject matter. Other reasons presented will be duly considered.] See § 2.27 for trademark applications.

3. Section 1.51 is revised to read as follows:

§ 1.51 *General requisites of an application.*

►(a)◄ Applications for patents must be made to the Commissioner of Patents and Trademarks. A complete application comprises:

►(1)◄ [(a)] A specification, including a claim or claims, see §§ 1.71 to 1.77.

►(2)◄ [(b)] An oath or declaration, see §§ 1.65 to 1.68.

►(3)◄ [(c)] Drawings, when necessary, see §§ 1.81 to 1.88.

►(4)◄ [(c)] The prescribed filing fee. (See 35 USC section 41 for filing fees.)

►(b) Applicants are encouraged to file a prior art statement at the time of filing the application or within three months thereafter. See §§ 1.97 through 1.99.◄

4. In § 1.52 paragraph (a) is revised to read as follows:

§ 1.52 *Language, paper, writing, margins.*

(a) The specification and oath or declaration must be in the English language ►except as provided in § 1.69◄. All papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly written or printed in permanent ink or its equivalent in quality. All of the application papers must be presented in a form having sufficient clarity and contrast between the paper and the writing or printing thereon to permit the production of readily legible copies in any number by use of photographic, electrostatic, photooffset, and microfiming processes. If the papers are not of the required quality, substitute typewritten or printed papers of suitable quality may be required.

* * * * *

5. Section 1.56 is revised to read as follows:

§ 1.56 ►*Duty of disclosure; striking of*◄ [*Improper*] *applications.*

►(a) A duty of candor and good faith toward the Patent and Trademark Office rests on the inventor, on each attorney or agent who prepares or prosecutes the application, and on every other individual who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application. All such individuals have a duty to disclose to the Office information they are aware of which is material to the examination of the application. Such information is material where there is a substantial likelihood that a reasonable examiner would consider it important in deciding whether to allow the application to issue as a patent. The duty is commensurate with the degree of involvement in the preparation or prosecution of the application.◄

►(b) Disclosures pursuant to this section may be made to the Office through an attorney or agent having responsibility for the preparation or prosecution of the application or through an inventor who is acting in his own behalf. Disclosure to such an attorney, agent or inventor shall satisfy the duty, with respect to the information disclosed, of any other individual. Such an attorney, agent or inventor has no duty to transmit information which is not material to the examination of the application.◄

►(c)◄ Any application [signed or sworn to in blank, or without actual inspection by the applicant, and any application altered or partly filled in after being signed or sworn to, and also any application fraudulently filed or in connection with which any fraud is practiced or attempted on the Patent and Trademark Office,] may be stricken from the files ►if:

(1) Signed or sworn to in blank, or without actual inspection by the applicant; or

(2) Altered or partly filled in after being signed or sworn to◄.

►(d) An application shall be stricken from the files if it is established by clear and convincing evidence that any fraud was practiced or attempted on the Office in connection with it or that there was any violation of the duty of disclosure through bad faith or gross negligence.◄

6. In the heading preceding § 1.65 "STATEMENT;" is deleted.

7. In § 1.65 the heading and paragraph (a) are revised to read as follows:

§ 1.65 ►*Oath or declaration.*◄ [*Statement of applicant.*]

(a)(1) The applicant, if the inventor, must state that he verily believes himself to be the original and first inventor or discoverer of the process, machine, manufacture, composition of matter, or improvement thereof, for which he solicits a patent; that he does not know and does not believe that the same was ever known or used in the United States before his invention or discovery thereof, and shall state of what country he is a citizen and where he resides and whether he is a sole or joint inventor of the invention claimed in his application. In every original application the applicant must distinctly state that to the best of his knowledge and belief the invention has not been in public use or on sale in the United States more than one year prior to his application or patented or described in any printed publication in any country before his invention or more than one year prior to his application, or patented or made the subject of an inventor's certificate in any foreign country prior to the date of his application on an application filed by himself or his legal representatives or assigns more than twelve months prior to his application in this country. ►He must acknowledge a duty to disclose information he is aware of which is material to the examination of the application.◄ He shall state whether or not any application for patent or inventor's certificate on the same invention has been filed in any foreign country, either by himself, or his legal representatives or assigns. If any such application has been filed, the applicant shall name the country in which the earliest such application was filed, and shall give the day, month, and year of its filing; he shall also identify by country and by day, month, and year of filing, every such foreign application filed more than twelve months before the filing of the application in this country.

(2) This statement (i) must be subscribed to by the applicant, and (ii) must either (*a*) be sworn to (or affirmed) as provided in § 1.66, or (*b*) include the personal declaration of the applicant as prescribed in § 1.68. See § 1.153 for design cases and § 1.162 for plant cases.

* * * * *

8. Section 1.69 is added to read as follows:

►§ 1.69 *Foreign language oaths and declarations.*◄

►(a) Whenever an individual making an oath or declaration cannot understand English, the oath or declaration must be in a language that such individual can understand and shall state that such individual understands the content of any documents to which the oath or declaration relates.◄

►(b) Unless the text of any oath or declaration in a language other than English is a form provided or approved by the Patent and Trademark Office, it must be accompanied by a verified English translation, except that in the case of an oath or declaration filed under § 1.65, the translation may be filed in the Office no later than two months after the filing date.◄

9. The heading "PRIOR ART STATEMENT" is added following § 1.95 and preceding § 1.97.

10. Section 1.97 is added to read as follows:

►§ 1.97 *Filing of prior art statement.*◄

►(a) As a means of complying with the duty of disclosure set forth in § 1.56, applicants are encouraged to file a prior art statement at the time of filing the application or within three months thereafter. The statement may either be separate from the specification or may be incorporated therein.◄

►(b) The statement shall serve as a representation that the prior art listed therein includes, in the opinion of the person filing it, the closest prior art of which that person is aware; the statement shall not be construed as a representation that a search has been made or that no better art exists.◄

11. Section 1.98 is added to read as follows:

►§ 1.98 *Content of prior art statement.*◄

►(a) Any statement filed under § 1.97 or § 1.99 shall include: (1) a listing of patents, publications or other information and (2) a concise explanation of the relevance of each listed item. The statement shall be accompanied by a copy of each listed patent or publication or other item of information in written form or of at least the portions thereof considered by the person filing the statement to be pertinent.◄

►(b) When two or more patents or publications considered material are substantially identical, a copy of a representative one may be included in the statement and others merely listed. A translation of the pertinent portions of foreign language patents or publications considered material should be transmitted if an existing translation is readily available to the applicant.◄

12. Section 1.99 is added to read as follows:

►§ 1.99 *Updating of prior art statement.*◄

►If prior to issuance of a patent an applicant, pursuant to his duty of disclosure under § 1.56, wishes to bring to the attention of the Office additional patents, publications or other information not previously submitted, the additional information should be submitted to the Office with reasonable promptness. It may be included in a supplemental prior art statement or may be incorporated into other communications to be considered by the examiner. Any transmittal of additional information shall be accompanied by explanations of relevance and by copies in accordance with the requirements of § 1.98.◄

13. Section 1.109 is added to read as follows:

►§ 1.09 *Reasons for allowance.*◄

►If the examiner believes that the record of the prosecution as a whole does not make clear his reasons for allowing a claim or claims, the examiner may set forth such reasoning. This shall be incorporated into an Office action rejecting other claims of the application or be the subject of a separate communication to the applicant. The applicant may file a statement commenting on the reasons for allowance within such time as may be specified by the examiner. Failure to file such a statement shall not give rise to any implication that the applicant agrees with or acquiesces in the reasoning of the examiner.◄

14. In § 1.175 paragraph (a) is revised to read as follows:

§ 1.175 *Reissue oath or declaration.*

(a) Applicants for reissue, in addition to complying with the requirements of the first sentence of § 1.65, must also file with their applications a statement under oath or declaration as follows:

(1) ►When the◄ [That] applicant verily believes the original patent to be wholly or partly inoperative or invalid, ►stating such belief◄ and the reasons why.

(2) When it is claimed that such patent is so inoperative or invalid "by reason of a defective specification or drawing," particularly specifying such defect.

(3) When it is claimed that such patent is inoperative or invalid "by reason of the patentee claiming more or less than he had a right to claim in the patent," distinctly specifying the excess or insufficiency in the claims.

►(4) When the applicant is aware of prior art or other information relevant to patentability, not previously considered by the Office, which might cause the examiner to deem the original patent wholly or partly inoperative or invalid, particularly specifying such prior art or other information and requesting that if the examiner so deems, the applicant be permitted to amend the patent and be granted a reissue patent.◄

►(5)◄ [4] Particularly specifying the errors ►or what might be deemed to be errors◄ relied upon, and how they arose or occurred.

►(6) Stating that ◄ [(5) That] said errors ►, if any,◄ arose "without any deceptive intention" on the part of the applicant.

* * * * *

15. Section 1.176 is revised to read as follows:

§ 1.176 *Examination of reissue.*

An original claim, if re-presented in the reissue application, is subject to reexamination, and the entire application will be examined in the same manner as original applications, subject to the rules relating thereto, excepting that division will not be required. Applications for reissue will be acted on by the examiner in advance of other applications ►, but not sooner than two months after announcement of the filing of the reissue application has appeared in the OFFICIAL GAZETTE◄.

16. Section 1.194 is revised to read as follows:

§ 1.194 ►*Oral*◄ *Hearing.*

►(a) An oral hearing should be requested only in those circumstances in which the appellant considers such a hearing necessary or desirable for a proper presentation of his appeal. An appeal decided without an oral hearing will receive the same consideration by the Board of Appeals as appeals decided after oral hearing.◄

►(b) If appellant requests an oral hearing, an oral argument may be presented by, or on behalf of, the primary examiner if considered desirable by either the primary examiner or the Board.◄

►(c)◄ If no request for oral hearing has been made by the appellant, the appeal will be assigned for consideration and decision. If the appellant has requested an oral hearing, a day of hearing will be set, and due notice thereof given to the appellant ►and to the primary examiner◄. Hearing will be held as stated in the notice, and oral argument will be limited to [one-half hour] ►twenty minutes for the appellant and fifteen minutes for the primary examiner◄ unless otherwise ordered before the hearing begins.

17. Section 1.196 is amended by adding new paragraph (d) to read as follows:

§ 1.196 *Decision by the Board of Appeals.*

* * * * *

►(d) Although the Board of Appeals normally will confine its decision to a review of rejections made by the primary examiner, should it have knowledge of any grounds for rejecting any allowed claim that it believes should be considered, it may include in its decision a statement to that effect and remand the case to the primary examiner for consideration thereof. In such event, the Board shall set a period, not less than one month, within which the applicant may submit to the primary examiner an appropriate amendment, or a showing of facts or reasons, or both, in order to avoid the grounds set forth in the statement of the Board of Appeals. If the primary examiner rejects the previously allowed claim or claims on the basis of such statement, the applicant may appeal to the Board of Appeals from the rejection. Whenever a decision of the Board of Appeals includes a remand, that decision shall not be considered as a final decision in the case, but the Board of Appeals shall, upon conclusion of the proceedings before the primary examiner on remand, either adopt its decision as final or render a new decision on all of the claims on appeal, as it may deem appropriate.◄

18. Section 1.291 is revised to read as follows:

§ 1.291 *Protests* ►*and prior art citations by public.*◄ [*to the grant of a patent.*]

►(a)◄ [The patent statutes do not provide for opposition to the grant of a patent on the part of the public. Protests to the grant of a patent are ordinarily merely acknowledged, and filed after being] ►Protests against pending applications will be acknowledged and◄ referred to the examiner having charge of the subject matter involved [for his information]. ►A protest specifically identifying the application to which the protest is directed will be entered in the application file and, if timely submitted and accompanied by a copy of each prior art document relied upon, will be considered by the examiner.◄

►(b) Citations of prior art and any papers related thereto may be entered in the patent file after a patent has been granted, at the request of a member of the public or the patentee. Such citations and papers will be entered without comment by the Patent and Trademark Office.◄

►(c) Protests and prior art citations by the public and any accompanying papers should either (1) reflect that a copy of the same has been served upon the applicant or patentee or upon his attorney or agent of record; or (2) be filed with the Office in duplicate in the event service is not possible.◄

19. In § 1.292 paragraph (b) is revised to read as follows:

§ 1.292 *Public use proceedings.*

* * * * *

(b) The petition and accompanying papers should [be filed in duplicate, or served upon the applicant, his attorney or

agent of record, and petitioner should offer to bear any expense to which the Office may be put in connection with the proceeding] ►either (1) reflect that a copy of the same has been served upon the applicant, or upon his attorney or agent of record; or (2) be filed with the Office in duplicate in the event service is not possible. The petition and accompanying papers, or a notice that such a petition has been filed, shall be entered in the application file.◄

20. Section 1.346 is revised to read as follows:

§ 1.346 *Signature and certificate of attorney.*

Every paper filed by an attorney or agent representing an applicant or party to a proceeding in the Patent and Trademark Office must bear the signature of such attorney or agent, except papers which are required to be signed by the applicant or party in person (such as the application itself and affidavits or declarations required of applicants). The signature of an attorney or agent to a paper filed by him, or the filing or presentation of any paper by him, constitutes a certificate that the paper has been read; that its filing is authorized; that to the best of his knowledge, information, and belief, there is good ground to support it ►, including any allegations of improper conduct contained therein◄; and that it is not interposed for delay.

Effective Date. These amendments become effective on March 1, 1977, except for §§ 1.51, 1.97, 1.98, and 1.99 which become effective on July 1, 1977, and §§ 1.65 and 1.69 which become effective on January 1, 1978.

Date: Jan. 18, 1977.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved:

BETSY ANCKER-JOHNSON, PH.D.
Assistant Secretary for Science and Technology.
Date: Jan. 19, 1977.

NOTE.—The above notice is identical to a notice that was published in the Federal Register of January 28, 1977 (42 F.R. 5588) except that the above notice shows the differences between the existing rules and the rules being adopted. Additions are indicated by arrows and deletions are indicated by brackets.

[955 O.G. 1054]

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(60) GUIDELINES FOR IMPLEMENTATION OF RECENTLY REVISED RULES

Recently a number of rules relating to Patent Examining and Appeal Procedures were revised. The new rules were published in the Federal Register at 42 F.R. 5588 on January 28, 1977, and in the OFFICIAL GAZETTE at 955 O.G. 1054 on February 22, 1977. The following guidelines are being published to describe the procedures which are being followed in implementing 37 CFR sections 1.11, 1.97–1.99, 1.109, 1.194, 1.291 and 1.292.

Files Open to the Public

Section 1.11(b) is applicable only to those reissue applications filed on or after March 1, 1977. Those reissue applications already on file will not be automatically open to inspection but a liberal policy will be followed by the Office of the Solicitor in granting petitions for access to such applications.

(NOTE.—These sections as changed will be incorporated into the Manual text in Rev. 3 of the Manual.)

For those reissue applications filed on or after March 1, 1977, the following procedure will be observed:

1) The filing of reissue applications will be announced in the OFFICIAL GAZETTE and will include certain identifying data as specified in section 1.11(b). Any member of the general public may request access to a particular reissue application filed after March 1, 1977. Since no record of such request is intended to be kept, an oral request will suffice.
2) The reissue application files will be maintained in the examining groups and inspection thereof will be supervised by group personnel. Although no general limit is placed on the amount of time spent reviewing the files, the Office may impose limitation, if necessary, e.g., where the application is actively being processed.
3) Where the reissue application has left the examining group for administrative processing, requests for access should be directed to the appropriate supervisory personnel in the Division or Branch where the application is currently located.
4) Requests for copies of papers in the reissue application file must be in writing addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 and may be either mailed or delivered to the Office mailroom. The price for copies made by the Office is thirty cents per page.

Prior Art Statements

This notice supersedes the notices of August 12, 1974 (926 O.G. 2) and May 19, 1975 (935 O.G. 902) relating to citations of prior art. Although new sections 1.97 through 1.99 are not effective until July 1, 1977, and are not mandatory upon applicants, they provide an ideal mechanism for complying with the duty of disclosure under 37 CFR 1.56. The statements should be submitted in accordance with the following guidelines:

1) Prior art statements should be submitted at the time of filing the application or within three months thereafter and may be separate from the specification or incorporated therein. The statement shall serve as a representation that the person preparing it has included therein what he believes to be the closet prior art of which he is aware and shall not be construed as a representation that no better art exists or that a search has been made. If the first action in the application is received prior to three months after filing of the application and no prior art statement has been submitted, the prior art statement may be submitted with the response to the first action and be considered timely.
2) The statement shall include a listing of the patents, publications or other information which the preparer of the statement wishes to cite and a concise explanation of the relevance of each listed item. Copies of the pertinent portions of all listed documents shall be supplied along with the statement, both when incorporated into the specification and when filed separately. If two or more patents or publications considered material are substantially identical, a copy of a representative one shall be included with the statement and others may merely be listed with an indication of which are considered to be substantially identical.
3) A translation of the pertinent portions of foreign language patents or publications considered material should be transmitted if an existing translation is readily available to the applicant. It will be sufficient, however, to transmit an equivalent English language patent or publication so long as it is identified as an equivalent.

   Where the applicant has submitted copies of prior art in accordance with these guidelines in a prior application, reference to the prior application and the submission therein will be sufficient for the continuing application as far as the copies are concerned. As far as the statement per se is concerned, the relevance of the prior art to the claimed subject matter must be indicated if it differs from its relevance as explained in the prior application.
4) If prior to the issuance of a patent an applicant pursuant to his duty of disclosure under 37 CFR 1.56, wishes to bring to the attention of the Office additional patents, publications or other information not previously submitted, the additional information should be submitted to the Office with reasonable promptness. It may be included in a supplemental prior art statement or may be incorporated into other communications to be considered by the examiner. Any transmittal of additional information shall be accompanied by explanations of relevance and by copies in accordance with the requirements aforementioned. The transmittal should include a statement explaining why the prior art was not earlier submitted.

While the Patent and Trademark Office will not knowingly ignore any prior art which might anticipate or suggest the claimed invention, no assurance can be given that cited art or other information not submitted in accordance with these guidelines will be considered by the examiner.

After the claims have been indicated as allowable by the examiner, e.g., by the mailing of an Ex parte Quayle action, a notice of allowability (PTOL–327), an examiner's amendment (PTOL–37), or a Notice of Allowance (PTOL–85), any citations submitted will be placed in the file. Since prosecution has ended, however, such submissions will not ordinarily be considered by the examiner unless the citation is accompanied by :

(*a*) A proposed amendment cancelling or further restricting at least one independent claim and narrowing the scope of protection sought ;

(*b*) A timely affidavit under 37 CFR 1.131 with respect to the material cited ; or

(*c*) A statement by the applicant or his attorney or agent that, in the judgment of the person making the statement, the prior art or other information cited raises a serious question as to the patentability of the claimed subject matter, or is closer prior art than that of record.

If the material is submitted after the base issue fee has been paid, it must also be accompanied by a petition under 37 CFR 1.183 requesting a waiver of 37 CFR 1.312. Such petition, if granted, would result in review of the art by the examiner and possible entry of the amendment.

In each instance where an examiner considers, but does not cite on form PTO–892, specific prior art referred to in a paper placed in the application file, the examiner will place a notation adjacent to the reference according to the following :

If included in the specification, the examiner will write his or her initials adjacent to any references checked and enter "checked" in the left margin opposite the initials. If presented in a separate paper or in the remarks of an amendment, the examiner's initials and "checked" will be entered adjacent to the citations or wherever possible to indicate clearly those checked.

Reasons for Allowance

One of the primary purposes of the change in Section 1.109 is to improve the quality and reliability of issued patents by providing a complete file history which should clearly reflect, as much as is reasonably possible, the reasons why the application was allowed. Such information facilitates evaluation of the scope and strength of a patent by the patentee and the public and may help avoid or simplify litigation of a patent.

The practice of stating the reasons for allowance is not new and the rule merely formalizes the examiner's existing authority to do so and provides applicants an opportunity to comment upon any such statement of the examiner.

When the examiner determines that it is necessary or desirable, a "Statement of Reasons for Allowance" will be prepared. The "Statement" will usually be an attachment to either a notice of allowability (PTOL–327) or Examiner's Amendment (PTOL–37). Any comments considered necessary by applicant must be submitted no later than the issue fee and should preferably *accompany* the issue fee. Submission with the issue fee avoids any delay in the processing of the application and avoids the necessity to associate the comments with the application while it is in issue except at the time the file must be pulled to record the payment of the issue fee. Such comments will be entered in the application file by the Allowed Files Branch with an appropriate notation on the "contents" list of the file wrapper, but will not be reviewed by the examiner.

Oral Hearings Before Board of Appeals

Section 1.194 clarifies the circumstances in which oral hearings should be requested and provides for oral arguments by, or on behalf of, primary examiners in certain appeals.

Under Section 1.194, the following procedures will be in effect :

1) In accordance with Section 1.192, appellants who desire an oral hearing must request the same at the time of filing the appeal brief.

2) If appellant has requested an oral hearing and the primary examiner intends to present an oral argument, the last paragraph of the examiner's answer will indicate this intention.

3) Notice of the oral hearing will be given to the appellant and, at the same time, to the primary examiner in those cases in which the primary examiner has indicated an intention to present an oral argument.

4) After an oral hearing has been confirmed and the date set as provided in Section 1.194(c), the application file will be delivered to the examiner via the appropriate Group Director at least one week prior to the date of the hearing for those cases in which the examiner is expected to be present at the hearing. In those cases where the Board requests the presentation of an oral argument by, or on behalf of, the primary examiner, the appellant will be so notified. The Board's request for an oral argument may, where appropriate, indicate specific points or questions to which the argument should be particularly directed. The application file will be returned to the Board before the hearing.

5) In those appeals in which an oral hearing has been confirmed and either the primary examiner or the Board has indicated a dessire for oral argument, such oral argument may be presented whether or not appellant appears.

Protests and Public Use Proceedings

Amended sections 1.291 and 1.292 give greater recognition to the value of written protests and public use petitions and are intended as an aid in avoiding the issuance of invalid patents.

Under sections 1.291 (b) and (c) and 1.292(b), the following procedures will be observed :

1) Only in those instances where it has not been possible to serve protest papers upon the applicant, attorney or agent, should duplicates of the papers submitted be provided. In this case the appropriate examining group will attempt to get the duplicate copy to the applicant, attorney or agent. However, every effort should be made by the protester to effect service.

2) Citations of prior art and any papers related thereto may be entered in the file after a patent has been granted by submitting them to the attention of the Record Room, where they will be entered without comment by the Office. If after diligent effort it has not been possible to serve the prior art citations and related papers on the patentee, his attorney or agent, duplicate copies should be submitted in which case the Record Room will attempt to get the duplicate copy to the owner of record.

3) When public use petitions and accompanying papers are submitted they, or a notice in lieu thereof, will be entered in the application file. Duplicate copies should be submitted only when, after diligent effort, it has not been possible for petitioner to serve a copy of the petition on the applicant, his attorney or agent in which case the Office of the Solicitor will attempt to get the duplicate copy to the applicant, his attorney or agent.

4) To ensure consideration by the examiner, protests should be timely submitted, i.e., before final rejection or allowance. Consideration of protests filed after final rejection or allowance will depend upon the relevance of the prior art documents and the point in time at which they are submitted. Documents which clearly anticipate or render obvious one or more claims will not knowlingly be ignored. If protests are not timely submitted or if they fail to comply with section 1.291(a) as to the submission of a copy of each prior art document relied upon, they will be acknowledged and referred to the examiner having charge of the subject matter involved for entry in the application file and such consideration as seems warranted.

In each instance where an examiner considers but does not cite on form PTO–892 specific prior art referred to in a protest, the examiner will place a notation in the protest paper adjacent to the reference which will include his or her initials and the term "checked."

Additional future guidelines as to protest procedures may be developed after gaining experience with the new practice.

C. MARSHALL DANN,
Mar. 18, 1977. *Commissioner of Patents and Trademarks.*

[957 O.G. 11]

(61) DEPOSIT OF COMPUTER PROGRAM LISTINGS

[37 CFR Part 1]

Notice of Proposed Rulemaking

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Proposed Rule.

SUMMARY: This proposed rule would amend the rules of practice to provide special procedures for presentation of computer program listings in patent applications. This proposal would reduce the present burden of presenting such listings on paper and would also reduce expenses for both the patent applicant and the Patent and Trademark Office.

DATES: Comments must be received on or before: September 13, 1977. Hearing: September 13, 1977, beginning at 9:30 a.m.

ADDRESSES: Send comments to: Commissioner of Patents and Trademarks, Washington, D.C. 20231. The hearing will be held in Room 11C24 of Building 3, Crystal Plaza, at 2021 Jefferson Davis Highway, Arlington, Virginia. Written comments and transcript of hearing will be available for public inspection in Room 11E10 of Building 3, Crystal Plaza, at 2021 Jefferson Davis Highway, Arlington, Virginia.

FOR FURTHER INFORMATION CONTACT: Mr. Louis O. Maassel by telephone at (703) 557-3070, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: Notice is hereby given that, pursuant to the authority contained in section 6 of the Act of July 19, 1952, as amended (68 Stat. 793; 85 Stat. 364; 88 Stat. 1949; 35 U.S.C. 6 as amended) the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by amending Sections 1.21 and 1.77 and by adding a new Section 1.96. This proposal has been reviewed pursuant to E.O. 11821 and OMB Circular A-107 and determined to have no major inflationary impact.

The purpose of the proposed rule change is to provide suitable procedures for presenting computer program listings where such listings are submitted with applications for patent to fulfill the disclosure requirements under 35 U.S.C. 112.

This proposal does not in any way imply that the Patent and Trademark Office considers computer programs per se to be patentable subject matter.

The provisions of 37 CFR Sections 1.52 and 1.84 were developed for and are suitable for the specification and drawings of most patent applications. However, when lengthy computer program listings must be included in order to provide a complete disclosure, their presentation in the conventional manner can become burdensome.

The cost of printing long computer programs or routines in patent documents is very expensive to the Office. The issue fees for the applicant, which are based on the number of pages or sheets, are correspondingly high.

Proposed new Section 1.96 sets forth alternative methods for presentation of such listings. Under paragraph (a), relatively short computer program listings (10 printout pages or less) will be printed as part of the patent. Paragraph (b) provides for submitting computer program listings which are 51 or more paper pages in length in the form of microfiche as an appendix. Computer program listings 11–50 pages in length may be submitted under the provisions of either paragraphs (a) or (b). Appendices on microfiche will not be printed in the patent but will become publicly available on the date the patent is issued. After patenting, the appendix will be prior art under 35 U.S.C. 102(e) as of the filing date of the application with which it was filed. Various incorporations by reference have been approved by the courts in *General Electric Company* v. *Brenner*, 159 USPQ 335; In re Hawkins, 179 USPQ 157, and In re Argoudelis et al., 168 USPQ 99.

Copies of publicly available computer program listing appendices may be purchased either as microfiche (148 mm x 105 mm card) at $1.00 per microfiche or as printed out on paper copy 30¢ per page.

The micrographic standards referred to in proposed Section 1.96(b)(2) may be obtained from either the National Micrographic Association, 8728 Colesville Road, Silver Spring, Maryland 20910 or the American National Standards Institute, 1430 Broadway, New York, New York, 10018.

1. Section 1.21 is proposed to be amended by adding a new paragraph (1) to read as follows:

Section 1.21. *Patent and miscellaneous fees and charges.*

* * * * *

(1) The fee for obtaining a microfiche copy, per microfiche ---------- $1.00

* * * * *

2. Section 1.77 is proposed to be amended by revising paragraph (c) to read as follows:

Section 1.77. *Arrangement of application.*

* * * * *

(c) (1) Cross-reference to related applications, if any.
(2) Reference to material incorporated by reference, if any. (See Sections 1.96(b) and (c)).

* * * * *

3. A new Section 1.96 is proposed to be added which reads as follows:

Section 1.96. *Submission of computer program listings.*

Computer program listings may be submitted in the following forms:

(a) *As part of application which is to appear in the patent.* If the computer program listing is contained on 10 printout pages or less, it may be submitted either as drawings or as part of the specification.

(1) *Drawings.* The listing may be submitted in the manner and complying with the requirements for drawings as provided in Section 1.84. At least one figure numeral is required on each sheet of drawing.

(2) *Specification.*

(i) The listing may be submitted as part of the specification in accordance with the provisions of Section 1.52, at the end of the description but before the claims.

(ii) The listing may be submitted as part of the specification in the form of computer printout sheets commonly (11 by 14 inches in size) for use as "camera ready copy" when a patent is subsequently printed. Such computer printout sheets must be original copies from the computer with dark solid black letters, on white, unshaded and unlined paper. the printing on each sheet must be limited to an area 9 inches high by 11 inches wide, and the sheets should be submitted in a protective cover. When printed in patents, such computer printout sheets will appear at the end of the description but before the claims and will be reduced about ½ in size with two printout sheets being printed as one patent specification page. Any corrections must be made by way of substitute sheets.

(b) *As an appendix which will not be printed.* If a computer program listing printout is more than 51 pages long, applicants must submit such listing in the form of microfiche, referred to in the specifications. The microfiche filed with a patent application is referred to as an appendix. The microfiche appendix will not be part of the printed patent. Reference in the application to the appendix should be made at the location indicated in Section 1.77(c).

(1) *Availability of appendix.* Such computer program listings on microfiche will be available to the public, and paper or microfiche copies will be available for purchase, after a patent is granted based on such an application. Any corrections must be made by way of revised microfiche.

(2) *Submission requirements.* Computer-generated information submitted as an appendix to an application for patent shall be in the form of microfiche in accordance with the standards set forth in National Micrographics Association (NMA) Standards—

MS1—Quality Standards for Computer Output Microfilm
MS2 (ANSI PH 5.18–1976)—Format and Coding Standards for Computer Output Microfilm
MS5 (ANSI PH 5.9–1975)—Microfiche of Documents
ANSI PH 2.19–1959—"Diffuse Transmission Density"—

except as modified or clarified below:

(i) Film submitted shall be first generation (camera film) negative appearing microfiche (wth emul-

sion on the back side of the film when viewed with the images right reading).

(ii) Either Computer-Output-Microfilm (COM output or copies of photographed paper copy may be submitted. In the former case, NMA standards MS1 and MS2 apply; in the latter case, standard MS5 applies.

(iii) Reduction ratio of microfiche submitted should be 24:1 or a similar ratio where variation from said ratio is required in order to fit the documents into the image area of the microfiche format used.

(iv) Film submitted shall have a thickness of at least .005 inches (0.13 mm) and not more than .009 inches (0.23 mm) for either cellulose acetate base or polyester base type.

(v) Both microfiche formats A1 (98 frames, 14 columns x 7 rows) and A3 (63 frames, 9 columns x 7 rows) which are described in NMA standard MS2 (A1 is also described in MS5) are acceptable for use in preparation of microfiche submitted.

(vi) At least the left-most ⅛ (50 mm x 12 mm) of the header of each microfiche submitted shall be clear or positive appearing so that the Patent and Trademark Office can apply serial number and filing date thereto in an eye-readable form. The middle portion of the header shall be used by applicant to apply an eye-readable application title together with inventor's name and any other bibliographic information the applicant sees fit to include. The final right-hand portion of the microfiche shall contain sequence information for the microfiche such as 1 of 4, 2 of 4, etc.

(vii) Additional requirements which supply specifically to microfiche of filmed paper copy or COM microfiche:

(a) Microfiche of filmed paper copy.

(1) The first frame of each microfiche submitted shall contain a standard NBS Microcopy Resolution Test Chart (No. 1010A).

(2) The second frame of each microfiche submitted must contain a fully descriptive title.

(3) The pages appearing on the microfiche frames should be consecutively numbered.

(4) Pagination of the microfiche frames shall be left to right and from top to bottom.

(5) At a reduction of 24:1 resolution of the original microfilm shall be at least 120 lines per mm (5.0 target) so that reproduction copies may be expected to comply with provisions of paragraph 7.1.4 of NMA Standard MS5.

(6) Background density of negative-appearing camera master microfiche of filmed paper documents shall be within the range 0.9 to 1.2 and line density should be no greater than 0.08. The density shall be visual diffuse density as measured using the method described in ANSI Standard PH 2.19–1959.

(7) A suitable index should be included on each microfiche.

(b) Microfiche generated by COM.

(1) Background density of negative-appearing COM-generated camera master microfiche shall be within the range of 1.7 to 2.0 and line density should be no greater than 0.2. The density shall be visual diffuse density as described in ANSI PH 2.19–1959.

(2) The first frame of each microfiche submitted shall contain a resolution test frame in conformance with NMA Standard MS1 (3.1.1).

(3) The second frame of each microfiche submitted must contain a fully descriptive title together with any other suitable index or other appropriate information.

(4) The pages appearing on the microfiche frames should be consecutively numbered.

(5) It is preferred that pagination of the microfiche frames be from left to right and top to bottom but the alternative, i.e., from top to bottom and from left to right, is also acceptable.

(c) *Optional use of either paragraph (a) or (b).* If the computer program listing is 11–50 pages long, applicants may utilize either the procedures of paragraph (a) or (b) of this section.

June 1, 1977. C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved June 7, 1977.

JORDAN J. BARUCH,
Assistant Secretary for Science and Technology.

[FR Doc. 77-17030; Filed 6-14-77; 8:45 a.m.]
42 FR 30522, June 15, 1977

[960 O.G. 2]

(Pending—No Final Action Taken)

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(62) PRACTICE RE: APPLICATIONS INVOLVING COMPUTER PROGRAMS

On November 18, 1976, the Court of Customs and Patent Appeals decided the cases of *In re Noll* and *In re Chatfield*. In both cases the Board of Appeals had taken the position that the claims were drawn to non-statutory subject matter under the Supreme Court's decision in *Gottschalk* v. *Benson*, 409 U.S. 63, 175 USPQ 673 (1972). The Noll application claims were drawn to an apparatus and the Chatfield application claims were drawn to a method.

The CCPA reversed the Board of Appeals in both cases. Until these decisions become final and since further review or clarification may be forthcoming, the patent examining corps will continue to examine computer programming applications in accordance with its current interpretation of the Supreme Court decision in the Benson case.

Prosecution will be resumed on all applications previously suspended under 37 CFR 1.103(b). No further programming applications will be suspended at the instance of the Office.

C. MARSHALL DANN,
Dec. 14, 1976. *Commissioner of Patents and Trademarks.*

[954 O.G. 550]

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(63) PRIORITY CLAIMS BASED ON INVENTORS' CERTIFICATES

Pursuant to the provisions of 35 U.S.C. 119, last paragraph (as amended July 28, 1972), 37 CFR 1.55(c) requires that when an applicant wishes to claim a right of priority on the basis of an application for an inventor's certificate, ". . . the applicant or his attorney or agent, when submitting a claim for such right . . . shall include an affidavit or declaration including a specific statement that, upon an investigation, he has satisfied himself that to the best of his knowledge the applicant, when filing his application for the inventor's certificate, had the option to file an application either for a patent or for an inventor's certificate as to the subject matter of the identified claim or claims forming the basis for the claim of priority."

As such, it has been and remains the position of the Patent and Trademark Office that, in accordance with 35 U.S.C. 119, applications for inventors' certificates shall give rise to a right of priority only when the country in which they are filed gives to applicants, at their discretion, the right to apply, on the same invention, either for a patent or for an inventor's certificate. The affidavit or declaration specified under 37 CFR 1.55(c) is only required for the purpose of ascertaining whether, in the country where the application for an inventor's certificate originated, this option generally existed for applicants with respect to the

particular subject matter of the invention involved. The requirements of 35 U.S.C. 119 and 37 CFR 1.55(c) are not intended, however, to probe into the eligibility of the particular applicant to exercise the option in the particular priority application involved.

It is recognized that certain countries that grant inventors' certificates also provide by law that their own nationals who are employed in state enterprises may only receive inventors' certificates and not patents on inventions made in connection with their employment. This will not impair their right to be granted priority in the United States based on the filing of the inventor's certificate.

Accordingly, affidavits or declarations filed pursuant to 37 CFR 1.55(c) need only show that in the country in which the original inventor's certificate was filed, applicants generally have the right to apply at their own option either for a patent or an inventor's certificate as to the particular subject matter of the invention.

C. MARSHALL DANN,
Aug. 17, 1977. *Commissioner of Patents and Trademarks.*

[962 OG 14]

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(64) REQUIREMENTS FOR PRIORITY DOCUMENTS, PRIORITY BASED ON APPLICATION FOR INDUSTRIAL DESIGN

In the Federal Republic of Germany, an application for protection of an industrial design may be accompanied by either a model or a drawing. It is understood that German residents file such applications with their local judicial authority ("Amtsgericht") rather than with the German Patent Office in Munich.

Questions have been raised in this connection as to:

(1) What sort of priority document under 35 U.S.C. 119 is required when the original filing has comprised a model rather than a drawing, and

(2) Whether it is necessary where the original filing was with a local judicial authority to obtain also a certificate from the national patent office.

As to the first question, the Patent and Trademark Office will receive under 35 U.S.C. 119, as evidence of an earlier filed design application which included the deposit of a model, drawings or acceptable photographs of the deposited model faithfully reproducing the design embodied therein together with other required information, certified by an official of the court or office with which the application was originally filed.

No additional certification by the national patent office wil be required. Article 4D(3) of the Paris Convention refers to certification ". . . by the authority which received such application . . ." so the reference in 35 U.S.C. 119 to "patent office" will be construed to extend also to the authority in charge of the design register.

C. MARSHALL DANN,
Aug. 15, 1977. *Commissioner of Patents and Trademarks.*

[962 OG 14]

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(65) RIGHT OF PRIORITY (35 U.S.C. 119) BASED ON A FOREIGN APPLICATION FILED UNDER A BILATERAL OR MULTILATERAL TREATY

Under Article 4A of the Paris Convention for the Protection of Industrial Property (21 UST 1583; 24 UST 2140; TIAS 6923, 7727; 852 O.G. 511) a right of priority may be based either on an application filed under the national law of a foreign country adhering to the Convention or on a foreign application filed under a bilateral or multilateral treaty concluded between two or more such countries. Examples of such treaties are the Hague Agreement Concerning the International Deposit of Industrial Designs, the Benelux Designs Convention, and the Libreville Agreement of September 13, 1962, relating to the creation of an African and Malagasy Industrial Property Office. The Convention on the Grant of European Patents and the Patent Cooperation Treaty will be further examples of such treaties once they enter into force.

The Priority Claim

In claiming priority of a foreign application previously filed under such a treaty, certain information must be supplied to the Patent and Trademark Office. In addition to the application number and the date of the filing of the application, the following information is required: (1) the name of the treaty under which the application was filed, (2) the name of at least one country other than the United States in which the application has the effect of, or is equivalent to, a regular national application, and (3) the name and location of the national or intergovernmental authority which received such application.

Certification of the Priority Papers

Section 119 of Title 35 of the United States Code requires the applicant to furnish a certified copy of priority papers. Certification by the authority empowered under a bilateral or multilateral treaty to receive applications which give rise to a right of priority under Article 4A(2) of the Paris Convention will be deemed to satisfy the certification requirement.

Aug. 9, 1977. C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

[962 OG 2]

APPEALS

(66) HEARINGS BEFORE THE BOARD OF APPEALS

In recent years the backlog of cases awaiting decision by the Board of Appeals has grown substantially. The average time elapsing between filing of the examiner's answer and final disposition is now roughly 17 months. Intensive effort by the Board and greater use of acting examiners-in-chief have been sucessful in raising the number of dispositions, but at the same time the number of appeals continues to grow. Thus in the first six months of 1974, the Board disposed of 1,193 appeals but received 1,915; in the last half of the year the Board disposed of 1,993 appeals but received 2,179.

In this connection it will be helpful if applicants and attorneys will dispense with oral hearings except where unusual circumstances are present which make a hearing important to the decision. Appeals submitted on brief receive just as careful consideration as those in which oral argument is presented, nor are any implications drawn as to the merits of the appeal from failure to request a hearing. It has been the Board's experience that in the ordinary case the hearing is not of great value in arriving at the ultimate decision.

Appellants are also encouraged to review cases where a hearing has already been requested, with a view to withdrawing the request if it is not necessary. It is particularly important that the Board be given timely notice whenever circumstances prevent the applicant or his representative from appearing at a scheduled hearing.

Rule 194 (37 CFR 1.194) limits oral argument to thirty minutes unless otherwise ordered by the Board. It has been the Board's experience, however, that effective arguments can be presented in less than thirty minutes in most cases. Effective immediately the Board will be informing appellants in the notices of hearing mailed to them that oral argument will be limited to *twenty minutes* unless otherwise ordered before the hearing begins.

The assistance of the public will be appreciated.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Date: Mar. 20, 1975.

[933 O.G. 1010]

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(67) REPLY BRIEFS

Applicants should clearly and specifically indicate in their reply briefs the new points of argument "raised in the examiner's answer" to which said reply briefs are directed. Rule 193(b) does not permit general rebuttal of each statement made in the examiner's answer; Consequently a reply brief which is not restricted to answering "new points" may be refused consideration in toto.

EDWIN L. REYNOLDS,
Apr. 15, 1969. *First Assistant Commissioner.*

[862 O.G. 343]

(68) APPEALS—CONFIDENTIAL MEMORANDA

The practice of presenting confidential memoranda to the Board of Appeals is hereby terminated. All correspondence with the Board of Appeals, whether by the Examiner or the applicant will be on the record. No unpublished decisions which are unavailable to the general public by reason of 35 U.S.C. 122 will be cited by the Examiner or the applicant except that either the Examiner or the applicant has the right to cite an unpublished decision in an application having common ownership with the application on appeal.

WILLIAM E. SCHUYLER, JR.,
July 28, 1970. *Commissioner of Patents.*

[877 O.G. 733]

(69) EXAMINER TESTIMONY

As stated in Section 1701 of the Manual of Patent Examining Procedure, patent examiners are forbidden to testify as patent experts or to express opinions, in testimony or otherwise, as to the invalidity of any issued patent. Patent examiners have, in connection with litigation involving patent validity, been called to testify on factual matters. In those cases, the practice has been to permit the examiner to testify only upon the issuance of a subpoena.

Henceforth, patent examiners will be permitted to testify on deposition in patent suits, without the need for a subpoena, provided the following conditions are satisfied:

1. The party proposing to take the testimony will state in writing, that the questions to be asked of the examiner will be phrased to comply with the permissible scope of inquiry as outlined in the protective orders contained in the Court opinions in *In re Mayewsky*, 162 USPQ 86, 89 and *Shaffer Tool Works* v. *Joy Manufacturing Co.*, 167 USPQ 170, 171: " . . . the scope of the oral depositions of the patent examiners is hereby limited to matters of fact and must not go into hypothetical or speculative areas or the bases, reasons, mental processes, analyses, or conclusions of the patent examiners in acting upon the patent applications maturing into the patent [in suit]." 167 USPQ 171.
2. That in addition to complying with the requirements of Rule 30 of the Federal Rules of Civil Procedure, the party taking the testimony will agree to give notice of the taking of the deposition of the patent examiner to the Solicitor, at least thirty days prior to the date on which the taking of the deposition is desired.
3. That the party taking the deposition arrange with the Solicitor to notice the deposition at a place convenient to the Patent Office.

If the party desiring to take the testimony of the examiner does not agree to the conditions enumerated, the Patent Office will not permit the examiner to be deposed without a subpoena and compliance with the procedure set forth in Section 7.02, Department of Commerce Administrative Order 205–12, June 29, 1967 as amended April 10, 1970. That section states:

> In any case where it is sought by subpoena, order or other compulsory process or other demand of a court or other authority (hereinafter referred to as a "demand") to require the production or disclosure of any record in the files of the Department of Commerce or other information acquired by an officer or employee of the Department as a part of the performance of his official duties or because of his official status, the matter shall be immediately referred for determination to the appropriate official described in subsection 4.01 of this order. If such official has discretion with respect to disclosure and he determines that it would be improper to comply with the demand, or if he has no discretion with respect to disclosure, the matter shall be promptly referred to the Secretary of Commerce for final determination. Unless and until the Secretary determines that the records or information should be produced, the officer or employee who appears in answer to the demand shall inform the court or other authority (*a*) that the section 7 of this order prohibits the officer or employee from producing or disclosing the records or other information demanded without the prior approval of the Secretary of Commerce, and (*b*) that the demand has been, or is being, as the case may be, referred for the prompt consideration of the Secretary. The officer or employee shall also provide the court or other authority with a copy of the regulations prescribed in this section 7 of this order, and shall respectfully request the court or other authority to stay the demand pending the receipt of instructions or directions from the Secretary of Commerce concerning the demand.

ROBERT GOTTSCHALK,
Mar. 13, 1972. *Commissioner of Patents.*

[897 O.G. 762]

INTERFERENCES

(70) INTERFERENCE PRACTICE

Listing of Attorneys or Agents in Final Decisions

A recent inquiry was made at the Board of Patent Interferences relating to the listing of attorneys' names in the heading of the final decisions of the Board of Patent Interferences.

Since this is a matter that may be of interest to those who prosecute interferences in the United States Patent and Trademark Office, the present practice of the Board of Patent Interferences is set forth below.

The heading of final decisions of the Board of Patent Interferences separately lists the names of all attorneys, agents or firms recognized as representing a party in the interference. Since firms have not been recognized by the Office since July 2, 1971, the listing of firm names is limited to firms of record in applications filed prior to July 2, 1971, and in unexecuted continuations or divisions thereof (Rule 60).

The names of the attorneys, agents or firms are taken from the interference file wrapper. The noted file wrapper lists the attorney or agent or firm of record in the applications or patent involved in the interference. Additionally, the name of any attorney presenting a party's oral argument at the final hearing is separately listed.

If a party desires to correct a firm name or exclude an attorney or agent previously of record from the above-noted decision, steps should be taken *promptly* to correct the files involved in the interference. This should be done by proceeding pursuant to the provisions of Rule 36, or by taking such other action as the party deems appropriate.

WALTER A. MODANCE,
May 6, 1975. *Chairman, Board of Patent Interferences.*

[935 O.G. 3]

(71) INTERFERENCE PRACTICE

Settlement Agreements

Inquiries by attorneys have been made from time to time at the Board of Patent Interferences as to why the Commissioner does not give notice to the parties or their attorneys of record, a reasonable time prior to termination of an interference, of the requirement relative to the filing of settlement agreements, citing 35 USC 135(*c*), second paragraph.

Attention is called to the fact that notice is given in the second full paragraph of Form POL–76, the letter to the parties advising them of the declaration of the interference.

WALTER A. MODANCE,
Oct. 15, 1975. *Chairman, Board of Patent Interferences.*

[940 O.G. 570]

(72) ACCESSIBILITY OF NON-FINAL DISCOVERY OPINIONS AND ORDERS ISSUED BY THE BOARD OF PATENT INTERFERENCES

A number of inquiries have been received from the patent bar and other interested persons relating to discovery practice under 37 C.F.R. § 1.287 before the Board of Patent Interferences. The inquiries indicate a need for making available to the public non-final Board opinions, including concurring and dissenting opinions, as well as orders, made in the ad-

judication of discovery matters before the Board. While non-final opinions need not be made available to the public [5 U.S.C. § 552(a)(2)], in order to satisfy the need, copies of non-final opinions issued by the Board will be kept in a file in the Service Branch of the Board in the U.S. Patent and Trademark Office (Crystal Plaza, Building 6, Eleventh Floor, Room 1116, Arlington, Virginia). Opinions in the file may be reviewed by the public during normal business hours (8:30 A.M. to 5:00 P.M.). Copies of opinions may be made by the public on reproducing equipment in the Service Branch with tokens at a cost of $0.15 per page or copies may be ordered at a cost of $0.30 per page [37 C.F.R. 1.21(b)].

In view of the provisions of 35 U.S.C. § 122 and 37 C.F.R. § 1.11(a), a consent will be obtained by the Office from all parties in an interference before an opinion issued in connection with the interference is placed in the file if the interference file is not otherwise available to the public. Preliminary indications are that the parties and their counsel generally consent.

In order to obtain optimum dissemination of the information contained in the file, opinions placed therein will be indexed according to specific topics. Copies of the index will be updated from time to time as the need occurs. Specific questions relating to the index and file may be directed to the Patent Interference Examiners.

The initial index is as follows:

Index

1.00 Discovery in general [37 C.F.R. § 1.287]
- 1.10 Requests and service under § 1.287(a)
- 1.20 Requests under § 1.287(b)
- 1.30 Motions for additional discovery under § 1.287(c)
  - 1.31 Related to derivation
  - 1.32 Related to abandonment, suppression, and concealment
  - 1.33 Related to inequitable conduct
  - 1.34 Other
- 1.40 Motions under § 1.287(d)(1)
- 1.50 Action under § 1.287(d)(2)
- 1.60 Agreements under § 1.287(e)

C. MARSHALL DANN,
Mar. 5, 1976. *Commissioner of Patents and Trademarks.*

[944 O.G. 2098]

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(73) INTERFERENCE PRACTICE

[37 CFR Part 1]

Notice of Proposed Rulemaking

Notice is hereby given that, pursuant to the authority contained in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6) as amended on October 5, 1971 (Pub. L. 92-132, 85 Stat. 364), the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by amending §§ 1.205, 1.207, 1.215, 1.216, 1.217, 1.222, 1.223, 1.225, 1.245, 1.247, 3.44, 3.45 and 5.3 and by adding § 1.246.

All persons are invited to present their views, objections, recommendations or suggestions relating to the proposed rule changes to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 on or before January 21, 1977. All comments received will be available for public inspection in Room 11E10 of Building 3, at 2021 Jefferson Davis Highway, Arlington, Virginia. No oral hearing will be held.

This proposal has been reviewed and determined to have no major inflationary impact.

These rule changes are intended to improve the practice before the Board of Patent Interferences and to correct some inconsistencies in the rules. The rule changes (1) provide a patentee with notice as soon as a claim is copied from the patent so that the patentee can preserve the invention records from the moment he receives said notice until the time, in some instances many years later, when an interference is ultimately declared between the patentee and the copier, (2) bring § 1.207(b) in confirmity with § 1.207(a), (3) simplify the rules relating to preliminary statements in view of the decisions, *Reddy* v. *Davis*, 187 USPQ 386 (Comm. Dec. 1975) and *Reddy* v. *Dann*, 188 USPQ 644 (CCPA 1976), (4) fill a void now existing in § 1.225, (5) make minor changes in §§ 1.245 and 1.247 and create new § 1.246 and (6) make § 1.217 consistent with § 1.215.

ATTENTION

The texts of the following proposed amendments are using ► ◄ arrows to indicate additions and [ ] brackets to indicate deletions.

It is proposed to amend 37 CFR, Parts 1, 3 and 5 as follows:

1. Revising § 1.205 by adding paragraph (c) thereto as follows:

§ 1.205 *Interference with a patent; copying claims from patent.*

* * * * *

►(c) A notice that one or more claims of a patent have been copied, or substantially copied by an applicant(s), will be placed in the file wrapper of the patent and a copy of said notice will be sent to the patentee. However, the identity of the applicant(s) will not be disclosed to the patentee unless an interference is declared.◄

2. By revising § 1.207(b) to read as follows:

§ 1.207. *Preparation of interference papers and declaration of interference.*

* * * * *

(b) A patent interference examiner will institute and declare the interference by forwarding notices to the several parties to the proceeding. Each notice shall include the name and residence of each of the other parties and those of his attorney or agent, and of any assignee, and will identify the application of each opposing party by serial number and filling date, or in the case of a patentee by the number and date of the patent. The notices shall also specify the issue of the interference, which shall be clearly and concisely defined in only as many counts as may be necessary to define the interfering subject matter (but in the case of an interference with a patent all the claims of the patent which can be made by the applicant should constitute the counts), and shall indicate the claim or claims of the respective cases corresponding to the count or counts. [If the application or patent of a party included in the interference is a division, continuation or continuation-in-part of a prior application and the examiner has determined that it is entitled to the filing date of such prior application, the notices shall so state.] ►If the primary examiner has indicated that the patent or application of any party included in the interference is entitled to the benefit of the filing date of any prior applications as to the subject matter in issue, the notices shall so state and shall specify such prior applications.◄ Except as noted in paragraph (e) of this section, the notices shall also set a schedule of times for taking various actions as follows:

(1) For filing the preliminary statements required by § 1.215 and serving notice of such filing, not less than 2 months from the date of declaration.

(2) For each party who files a preliminary statement to serve a copy thereof on each opposing party who also files a preliminary statement as required by § 1.215(b), not less than 15 days after the expiration of the time for filing preliminary statements.

(3) For filing motions under § 1.231, not less than 4 months from declaration.

* * * * *

3. By revising § 1.215(b) to read as follow

§ 1.215 *Preliminary statement required.*

* * * * *

(b) A party who files a preliminary statement shall at the same time notify all opposing parties of that fact and by the time set for that purpose he shall serve a copy of his preliminary statement [and all attached documents on every opposing party from whom he has received notification of the filing of a statement.] ►on every opposing party from whom he has received notification of the filing of a statement.◄

* * * * *

4. By revising § 1.216 to read as follows:

§ 1.216 *Contents of the preliminary statement.*

(a) The preliminary statement must state that the party made the invention set forth by each count of the interfer-

ence, and whether the invention was made in the United States or abroad. When the invention was made in the United States the preliminary statement must set forth as to the invention defined by each count the following facts:

(1) The date upon which the [first drawing of the invention was made; if a drawing of the invention has not been made prior to the filing date of the application, it must be so stated.] ►invention of each count was conceived.◄

(2) The date [upon which the first written description of the invention was made; if a written description of the invention has not been made prior to the filing date of the application, it must be so stated.] ►after conception of said invention when active exercise of reasonable diligence toward reducing the invention to practice began.◄

(3) The date [upon which the invention was first disclosed to another person; if the invention was not disclosed to another person prior to the filing date of the application, it must be so stated.] ►of the actual reduction to practice of the invention; if the invention has not actually been reduced to practice before the filing date of the involved application, it must be so stated.◄

[(4) The date of the first act or acts susceptible of proof (other than making a drawing or written description or disclosing the invention to another person) which, if proven, would establish conception of the invention, and a brief description of such act or acts; if there have been no such acts, it must be so stated.

(5) The date of the actual reduction to practice of the invention; if the invention has not been actually reduced to practice before the filing date of the application, it must be so stated.

(6) The date after conception of the invention when active exercise of reasonable diligence toward reducing the invention to practice began.]

Paragraph (b) is deleted and present paragraph (c) is substituted as new paragraph (b) as follows:

[(b) When an allegation as to the first drawing (paragraph (a)(1) of this section) and/or as to the first written description (paragraph (a)(2) of this section) is made, a copy of such drawing and/or written description must be attached to the statement. (See § 1.223(c).)]

[(c)] ►(b)◄ If a party intends to rely solely on a prior application, domestic or foreign, and on no other evidence, the preliminary statement may so state and need not be signed or sworn to or declaration made by the inventor.

5. By revising § 1.217 to read as follows:

§ 1.217 *Contents of the preliminary statement; invention made abroad.*

[(a)] When the invention was made abroad the facts specified by § 1.216(a)(1) to [(6)] ►(3)◄ are not required, and in lieu thereof there should be stated:

(1) When the invention was introduced into this country by or on behalf of the party, giving the circumstances with the dates connected therewith which are relied upon to establish the fact and, when appropriate, including allegations of activity in this country of the nature of that represented by § 1.216(a)(1) to [(6)] ►(3).◄ [and documentary attachments if the allegations relate to a drawing or written description.] ►Such statement may be signed and sworn to, or made in the form of a declaration, either by the inventor or by one authorized to make the statement and having knowledge of the facts alleged therein.◄

(2) If a party is entitled to the benefit of the second sentence of 35 U.S.C. 104, he must so state and his preliminary statement must include allegations of activity abroad corresponding to those required by § 1.215(a) (1) to [(6)] (3).

6. By revising § 1.222 to read as follows:

§ 1.222 *Correction of statement on motion.*

In case of material error arising through inadvertence or mistake, the statement [or attachments] may be corrected [or omitted attachments may be supplied on motion] (see § 1.243), upon a satisfactory showing that such action is essential to the ends of justice. The motion must be made, if possible, before the taking of any testimony, and as soon as practicable after the discovery of the error.

7. By revising § 1.223(c) to read as follows:

§ 1.223 *Effect of statement.*

* * * * *

(c) If a party to an interference fails to file a statement, testimony will not be received subsequently from him to prove that he made the invention at a date prior to his effective filing date. [If a party alleges in his statement a date of first drawing or first written description but does not attach a copy of such drawing or written description as required by § 1.216(b), he will be restricted to his effective filing date as to that allegation unless such copy is admitted by motion under § 1.222.]

* * * * *

8. By revising § 1.225 to read as follows:

§ 1.225. *Failure of junior party to file statements or to overcome filing date of senior party.*

If a junior party to an interference fails to file a preliminary statement, or if his statement fails to overcome the effective filing date of the application of another party, judgment on the record will be entered against such junior party unless he has filed a proper motion under § 1.231, within the time set for such motions, seeking some action in the interference. If such motion has been timely filed but does not result in action in the interference which removes the basis for a judgment on the record, such judgment will be entered unless the motion related to a matter which may be reviewed at final hearing under § 1.258, and within 30 days of the decision denying his motion, or a later time set by the patent interference examiner, the junior party concerned requests that final hearing be set to review such matter. ►If, as a result of a decision on motion, the original senior party is deprived of the benefit of an earlier filed application and is thereby made a junior party and if in addition he relies solely on said earlier filed application in his preliminary statement, he stands in the same position as a junior party whose statement fails to overcome the effective filing date of the senior party as in the first sentence of § 1.225.◄ Also, such a junior party may within such 30 day period, or time set, request a final hearing to review such a matter raised by his opposition to a motion under § 1.231(a), (2), (3), (4), or (5) which was granted over his opposition. Such a junior party will not be permitted to take testimony except on granting of a motion accompanied by a showing of good cause, which should normally include names of proposed witnesses and affidavits or declarations by them giving their expected testimony.

9. Revising § 1.245 by deleting the second sentence thereof so as to read as follows:

§ 1.245 *Extension of time.*

Extensions of time in any case not otherwise provided for may be had by stipulation of the parties, subject to approval, or on motion duly brought, sufficient cause being shown for such extention. [A motion not timely made may be considered upon a showing of sufficient cause as to why such motion was not timely presented.]

10. By adding new rule § 1.246 as follows:

►§ 1.246. *Late papers.*

A motion or other paper belatedly filed will not normally be considered except upon a showing, under oath or in the form of a declaration (§ 1.68), of sufficient cause as to why such motion or paper was not timely presented.◄

11. Revising the format of § 1.247 so as to read as follows:

§ 1.247 *Service of papers.*

►(a)◄ Every paper filed in the Patent and Trademark Office in interference proceeding must be served upon the other parties in the manner provided in § 1.248, except the following:

[(a)] ►(1)◄ Preliminary statements at the time of filing but see § 1.215(b) and (c).

[(b)] ►(2)◄ Documentary exhibits introduced at the taking of a deposition.

[(c)] ►(3)◄ Certified transcripts of testimony under § 1.276 (but copies of the record must be served (§ 1.253(a)).

[(d)] ►(4)◄ Statutory disclaimers under 35 U.S.C. 253.

►(b)◄ The specification in certain sections that a designated paper must be served does not imply that other papers, not expected above need not be served. However, the requirement for service of designated papers may be waived under particular circumstances and service may be required of other designated papers which need not ordinarily be served. Proof of service must be made before the paper will be considered in the interference by the Office. A statement of the attorney, attached to or appearing in the original paper when filed, clearly stating the time and manner in which service was made will be accepted as prima facie proof of service.

12. By revising § 3.44 to read as follows:

§ 3.44 *Interference; preliminary statement of domestic inventor.*

Preliminary statement _____
_____
v. } Interference No. _____
_____
_____ } ss
_____, being duly sworn (or affirmed), deposes and says that he is a party to the above identified interference, that he made the invention set forth by [the counts] ►each count◄ of the interference in the United States; that

(1) [The first drawing of the invention was made] ►The invention of each count was conceived◄ on _____, 19____. [A copy is attached.[1]]

(2) [The first written description of the invention was made] ► Active exercise of reasonable diligence toward reducing the invention to practice began◄ on _____, 19____. [A copy is attached.[1]]

(3) The invention was [first disclosed to others] ►actually reduced to practice◄ on _____, 19____.[1]

[(4) The date of the first act or acts susceptible of proof, other than acts of the character specified in (1), (2), and (3) which, if proven, would establish conception of the invention, and a brief description of such act or acts are (e.g. the making of a non-operating model on _____, 19____).

(5) The invention was actually reduced to practice on _____, 19____.

(6) Active exercise of reasonable diligence toward reducing the invention to practice began on _____, 19____.[1]]

_____
(Signature of inventor)

Subscribed and sworn to (or affirmed) before me this ____date of _____, 19____.

[SEAL]

_____
(Signature of notary public officer)

_____
(Official character)

13. Revising § 3.45 by changing line 3 of the last paragraph of the section.

§ 3.45 *Interference; preliminary statement of foreign inventor.*

* * * * *

* * * When acts were performed in the United States corresponding to the allegations (1) through [(6)] ►(3)◄ in the preliminary statement of a domestic inventor (§ 3.44) these acts should be included by appropriate allegations in the preliminary statement of a foreign inventor.

14. Revising § 5.3(b) by adding a third sentence as follows:

§ 5.3 *Prosecution of application under secrecy order; withholding patent.*

(b) * * * An interference will not be declared involving applications under secrecy order. However, if an application under secrecy order copies claims from an issued patent, a notice of that fact will be placed in the file wrapper of the patent. ►See § 1.205(c).◄

* * * * *

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Dated: November 19, 1976.

Approved:

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

[FR Doc.76-35049; Filed 11-29-76; 8:45 am]

(Pending—No Final Action Taken)

[1] If there were no act corresponding to this allegation prior to the filing date of the application, it must be so stated. [Note, however, date of completion of application drawing and specification, date of disclosure to person preparing the application, and diligence in preparing the application.]

MISCELLANEOUS

(74) DISCLOSURE DOCUMENT PROGRAM

This notice consolidates and supersedes the notices of Mar. 26, 1969 (862 O.G. 1) and Aug. 11, 1970 (878 O.G. 1) relating to the Patent Office Disclosure Document Program.

Under this program the Patent Office accepts and preserves, for a period of two years, papers referred to as "Disclosure Documents." These papers may be used as evidence of the dates of conception of inventions.

THE PROGRAM

A paper disclosing an invention and signed by the inventor or inventors may be forwarded to the Patent Office by the inventor (or by any one of the inventors when there are joint inventors), by the owner of the invention, or by the attorney or agent of the inventor(s) or owner. It will be retained for two years and then be destroyed unless it is referred to in a separate letter in a related patent application within said two years.

A Disclosure Document is not a patent application and the date of its receipt in the Patent Office will not become the effective filing date of any patent application subsequently filed. However, like patent applications, these documents will be kept in confidence by the Patent Office. If patent protection is desired, a patent application should be filed as soon as possible.

This program does not diminish the value of conventional witnessed and notarized records as evidence of conception of an invention, but it should provide a more credible form of evidence than that provided by the popular practice of mailing a disclosure to oneself or another person by registered mail. The program is made available as a service to those persons desiring to use it.

CONTENT OF DISCLOSURE DOCUMENT

Although there are no restrictions as to content and claims are not necessary, the benefits afforded by a Disclosure Document will depend directly upon the adequacy of the disclosure. Therefore, it is strongly urged that the document contain a clear and complete explanation of the manner and process of making and using the invention in sufficient detail to enable a person having ordinary knowledge in the field of the invention to make and use the invention. When the nature of the invention permits, a drawing or sketch should be included. The use or utility of the invention should be described, especially in chemical inventions.

The Disclosure Document must be limited to written matter or drawings on paper or other thin, flexible material, such as linen or plastic drafting material, having dimensions or being folded to dimensions not to exceed 8½ by 13 inches. Photographs also are acceptable. Each page should be numbered. Text and drawings should be sufficiently dark to permit reproduction with commonly used office copying machines.

A $10 fee is charged for filing a Disclosure Document. Payment must accompany the Disclosure Document when it is submitted to the Patent Office.

In addition to the $10 fee, the Disclosure Document must be accompanied by a stamped, self-addressed envelope and a separate paper in duplicate, signed by the inventor, stating that he is the inventor and requesting that the material be received for processing under the Disclosure Document Program. The papers will be stamped by the Patent Office with an identifying number and date of receipt, and the duplicate request will be returned in the self-addressed envelope together with a warning notice indicating that the Disclosure Document may be relied upon only as evidence and that a patent application should be diligently filed if patent protection is desired. The inventor's request may take the following form:

"The undersigned, being the inventor of the disclosed invention, requests that the enclosed papers be accepted under the Disclosure Document Program, and that they be preserved for a period of two years."

RETENTION

The Disclosure Document will be preserved in the Patent Office for two years after its receipt and will then be destroyed unless it is referred to in a separate letter in a related patent application filed within the two-year period. The Disclosure Document must be referred to in the separate letter by title, number, and date of receipt. Acknowledgment of receipt of such letters will be made in the next official communication or in separate letter from the Patent Office. Unless it is de-

sired to have the Patent Office retain the Disclosure Document beyond the two-year period, it is not required that it be referred to in a patent application.

WARNING AS TO LIMITATIONS

The two-year retention period should not be considered to be a "grace period" during which the inventor can wait to file his patent application without possible loss of benefits. It should be recognized that in establishing priority of invention an affidavit or testimony referring to a Disclosure Document must usually also establish diligence in completing the invention or in filing the patent application since the filing of the Disclosure Document.

Inventors are also reminded that any public use or sale in the United States, or publication of the invention anywhere in the world, more than one year prior to the filing of a patent application on that invention will prohibit the granting of a patent on that invention.

If the inventor is not familiar with what is considered to be "diligence in completing the invention" or "reduction to practice" under the patent law, or if he has other questions about patent matters, the Patent Office advises him to consult an attorney or agent registered to practice before the Patent Office. Patent attorneys and agents may be found in the telephone directories of most major cities. Also, many large cities have associations of patent attorneys which may be consulted.

RICHARD A. WAHL,
Jan. 4, 1971. *Assistant Commissioner of Patents.*

[883 O.G. 3]

(75)

POSTAL SERVICE EMERGENCY CONTINGENCY PLAN

The U.S. Patent and Trademark Office is establishing the following contingency plan for filing any paper or paying any fee in the Office in the event of an emergency caused by any major interruption in the mail service in the United States. Upon determination by the Commissioner of Patents and Trademarks that such an emergency exists, a notice activating the plan will be issued by the Commissioner. The activating notice will be published in the Wall Street Journal and made available in a special recorded telephone message at area code 703, 557–3158. Also, certain publications, patent bar groups, and other organizations closely associated with the patent system, will be notified. Termination of the program will be similarly announced. Where the postal emergency is not nationwide, the Commissioner will designate the areas of the United States in which the procedures outlined below will be in effect.

U.S. Department of Commerce District Offices (formerly referred to as Department of Commerce Field Offices) will be designated on an emergency basis, as receiving stations for filing papers and paying fees in the U.S. Patent and Trademark Office.

Upon determination that an emergency exists, the following procedures may be followed: All papers and fees should be enclosed in a sealed envelope addressed to the Patent and Trademark Office and deposited in one of the District Offices. Such papers will be considered as received in the U.S. Patent and Trademark Office on the day of deposit. The District Office will date stamp each envelope and the accompanying receipt card which completely identifies the deposited papers. The receipt card will be returned to the depositor. Applicants or their representatives should assure the legibility of the date stamp.

District Office deposits should be limited to checks in payment of issue fees, new application papers wherein priority dates or statutory bars may be involved, amendments where the six month statutory period for response is about to expire, trademark oppositions, Section 8 affidavits, trademark renewals, and to other papers for which the patent and trademark statutes do not provide a remedy for failure to obtain a particular date.

Where papers originate from overseas, it is suggested that the papers be mailed to a registered agent in Canada, with a request that the papers be forwarded by courier to the nearest District Office in the United States.

In regard to pending applications, if the time for taking any action or paying any fee expires during the period that the Commissioner declares to be an emergency, the time will be extended until one month after the end of the emergency period, provided that such extension does not exceed the maximum period for response provided for in the statutes.

Since this extension of time will be automatic, there will be no record in the individual files to indicate that a response filed during the extended period is in fact timely. In order to provide a complete record, applicants or their representatives should file a paper referring to this notice in each case in which a response is filed during the extended period.

The addresses of the Department of Commerce District Offices, subject to subsequent changes, are as follows:

ALBUQUERQUE, N.M., 87101, Room 316, U.S. Courthouse (505) 766–2386.

ANCHORAGE, 99501, 632 Sixth Ave., Hill Bldg., Suite 412 (907) 265–4597.

ATLANTA, 30309, Suite 523, 1401 Peachtree St., NE. (404) 526–6000.

BALTIMORE, 21202, 415 U.S. Customhouse, Gay and Lombard Sts. (301) 962–3560.

BIRMINGHAM, ALA., 35205, Suite 200–201, 908 S. 20th St. (205) 325–3327.

BOSTON, 02116, 10th Floor, 441 Stuart St. (617) 223–2312.

BUFFALO, N.Y., 14202, Room 1312, Federal Bldg., 111 W. Huron St. (716) 842–3208.

CHARLESTON, W. VA., 25301, 3000 New Federal Office Bldg., 500 Quarrier St. (304) 343–6181, Ext. 375.

CHEYENNE, WYO., 82001, 6022 O'Mahoney Federal Center, 2120 Capitol Ave. (307) 778–2151.

CHICAGO, 60603, Room 1406, Mid-Continental Plaza Bldg., 55 E. Monroe St. (312) 353–4450.

CINCINNATI, 45202, 8028 Federal Office Bldg., 550 Main St. (513) 684–2944.

CLEVELAND, 44114, Room 600, 666 Euclid Ave. (216) 522–4750.

COLUMBIA, S.C., 29204, Forest Center, 2611 Forest Dr. (803) 765–5345.

DALLAS, 75202, Room 3E7, 1100 Commerce St. (214) 749–1515.

DENVER, 80202, Room 161, New Custom House, 19th and Stout Sts. (303) 837–3246.

DES MOINES, IOWA, 50309, 609 Federal Bldg., 210 Walnut St. (515) 284–4222.

DETROIT, 48226, 445 Federal Bldg. (313) 226–3650.

GREENSBORO, N.C., 27402, 203 Federal Bldg., W. Market St., P.O. Box 1950. (919) 275–9111, Ext. 345.

HARTFORD, CONN, 06103, Room 610–B, Federal Office Bldg., 450 Main St. (203) 244–3530.

HONOLULU, 96813, 286 Alexander Young Bldg., 1015 Bishop St. (808) 546–8694.

HOUSTON, 77002, 201 Fannin, 1017 Federal Office Bldg. (713) 226–4231.

INDIANAPOLIS, 46204, 355 Federal Office Bldg., 46 E. Ohio St. (317) 269–6214.

KANSAS CITY, MO., 64106, Room 1840, 601 E. 12th St. (816) 374–3142.

LOS ANGELES, 90024, 11201 Federal Bldg., 11000 Wilshire Blvd. (213) 824–7591.

MEMPHIS, 38103, Room 710, 147 Jefferson Ave. (901) 534–3213.

MIAMI, 33130, Rm. 821, City National Bank Bldg., 25 W. Flagler St. (305) 350–5267.

MILWAUKEE, 53203, Straus Bldg., 238 W. Wisconsin Ave. (414) 224–3473.

MINNEAPOLIS, 55401, 306 Federal Bldg., 110 S. Fourth St. (612) 725–2133.

NEW ORLEANS, 70130, Room 432, International Trade Mart, 2 Canal St. (504) 589–6546.

NEW YORK, 10007, 41st Floor, Federal Office Bldg., 26 Federal Plaza, Foley Sq. (212) 264–0634.

NEWARK, N.J., 07102, Gateway Bldg., (4th floor) (201) 645–6214.

PHILADELPHIA, 19106, 9448 Federal Bldg., 600 Arch St. (215) 597–2850.

PHOENIX, ARIZ., 85004, 508 Greater Arizona Savings Bldg., 112 N. Central Ave. (602) 261–3285.

PITTSBURGH, 15222, 431 Federal Bldg., 1000 Liberty Ave. (412) 644–2850.

PORTLAND, ORE., 97205, 921 SW. Washington St., Suite 521, Pittock Block. (503) 221–3001.

RENO, NEV., 89502, 2028 Federal Bldg., 300 Booth St. (702) 784–5203.

RICHMOND, VA., 23240, 8010 Federal Bldg., 400 N. 8th St. (804) 782–2246.

ST. LOUIS, 63105, Chromalloy Bldg., 120 S. Central Ave. (314) 622–4243.

SALT LAKE CITY, 84111, 1201 Federal Bldg., 125 S. State St. (801) 524–5116.

SAN FRANCISCO, 94102, Federal Bldg., Box 36013, 450 Golden Gate Ave., (415) 556–5860.

SAN JUAN, P.R., 00902, Room 100, Post Office Bldg. (809) 723–4640.

SAVANNAH, 31402, 235 U.S. Courthouse and Post Office Bldg., 125–29 Bull St. (912) 232–4204.

SEATTLE, 98109, 706 Lake Union Bldg., 1700 Westlake Ave. North (206) 442–5615.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

July 18, 1975.

[937 O.G. 886]

(76) PATENT COOPERATION TREATY: IMPLEMENTING LEGISLATION AND RATIFICATION

Public Law 94–131, as reprinted below, implements the Patent Cooperation Treaty (see Official Gazette, Volume 876, page 341; July 14, 1970) which was signed by the United States and 34 other countries in 1970. After enactment of the implementing legislation on November 14, 1975, the United States ratified the Treaty on November 26, 1975, thereby becoming the first country with major patent activity to do so. In accordance with the provisions of Article 63 of the Treaty, it enters into force three months after eight countries have adhered to it, four of which must have certain defined major patent activity.

Up to the time of United States ratification eight countries with only minor patent activity had adhered to the Treaty. Ratification by the United States, therefore, represents a significant step in the direction of bringing the Treaty into force. Other countries with major patent activity, and especially European countries, have been awaiting United States ratification before adhering themselves. Consequently, it is hoped that United States commitment to the Treaty has been demonstrated and will encourage adherence by other countries with major patent activity, thereby bringing into force a Treaty which would offer many advantages and benefits to patent applicants and patent offices alike. Because of the necessary action of other countries in bringing the Treaty into force, no exact date can be given at this time. It is presently estimated, however, that at least the necessary number of countries would be reached in Fiscal Year 1977.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Date: Dec. 11, 1975.

Public Law 94-131
94th Congress, S. 24
November 14, 1975

An Act

To carry into effect certain provisions of the Patent Cooperation Treaty, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That title 35, United States Code, entitled "Patents", be amended by adding at the end thereof a new part IV to read as follows:

Patent Cooperation Treaty.

"PART IV.—PATENT COOPERATION TREATY

"Chapter 35.—DEFINITIONS

"Sec.
"351. Definitions.

"§ 351. Definitions 35 USC 351.

"When used in this part unless the context otherwise indicates—

"(a) The term 'treaty' means the Patent Cooperation Treaty done at Washington, on June 19, 1970, excluding chapter II thereof.

"(b) The term 'Regulations', when capitalized, means the Regulations under the treaty excluding part C thereof, done at Washington on the same date as the treaty. The term 'regulations', when not capitalized, means the regulations established by the Commissioner under this title.

"(c) The term 'international application' means an application filed under the treaty.

"(d) The term 'international application originating in the United States' means an international application filed in the Patent Office when it is acting as a Receiving Office under the treaty, irrespective of whether or not the United States has been designated in that international application.

"(e) The term 'international application designating the United States' means an international application specifying the United States as a country in which a patent is sought, regardless where such international application is filed.

"(f) The term 'Receiving Office' means a national patent office or intergovernmental organization which receives and processes international applications as prescribed by the treaty and the Regulations.

"(g) The term 'International Searching Authority' means a national patent office or intergovernmental organization as appointed under the treaty which processes international applications as prescribed by the treaty and the Regulations.

"(h) The term 'International Bureau' means the international intergovernmental organization which is recognized as the coordinating body under the treaty and the Regulations.

"(i) Terms and expressions not defined in this part are to be taken in the sense indicated by the treaty and the Regulations.

"Chapter 36.—INTERNATIONAL STAGE

"Sec.
"361. Receiving Office.
"362. International Searching Authority.
"363. International application designating the United States: Effect.
"364. International stage: Procedure.
"365. Right of priority; benefit of the filing date of a prior application.
"366. Withdrawn international application.
"367. Actions of other authorities: Review.
"368. Secrecy of certain inventions; filing international applications in foreign countries.

35 USC 361. **"§ 361. Receiving Office**

"(a) The Patent Office shall act as a Receiving Office for international applications filed by nationals or residents of the United States. In accordance with any agreement made between the United States and another country, the Patent Office may also act as a Receiving Office for international applications filed by residents or nationals of such country who are entitled to file international applications.

"(b) The Patent Office shall perform all acts connected with the discharge of duties required of a Receiving Office, including the collection of international fees and their transmittal to the International Bureau.

"(c) International applications filed in the Patent Office shall be in the English language.

"(d) The basic fee portion of the international fee, and the transmittal and search fees prescribed under section 376(a) of this part, shall be paid on filing of an international application. Payment of designation fees may be made on filing and shall be made not later than one year from the priority date of the international application.

Post, p. 690.

35 USC 362. **"§ 362. International Searching Authority**

"The Patent Office may act as an International Searching Authority with respect to international applications in accordance with the terms and conditions of an agreement which may be concluded with the International Bureau.

35 USC 363. **"§ 363. International application designating the United States: Effect**

"An international application designating the United States shall have the effect, from its international filing date under article 11 of the treaty, of a national application for patent regularly filed in the Patent Office except as otherwise provided in section 102(e) of this title.

Post, p. 691.

35 USC 364. **"§ 364. International stage: Procedure**

"(a) International applications shall be processed by the Patent Office when acting as a Receiving Office or International Searching Authority, or both, in accordance with the applicable provisions of the treaty, the Regulations, and this title.

"(b) An applicant's failure to act within prescribed time limits in connection with requirements pertaining to a pending international application may be excused upon a showing satisfactory to the Commissioner of unavoidable delay, to the extent not precluded by the treaty and the Regulations, and provided the conditions imposed by the treaty and the Regulations regarding the excuse of such failure to act are complied with.

35 USC 365. **"§ 365. Right of priority; benefit of the filing date of a prior application**

"(a) In accordance with the conditions and requirements of section 35 USC 119. 119 of this title, a national application shall be entitled to the right of

priority based on a prior filed international application which designated at least one country other than the United States.

"(b) In accordance with the conditions and requirement of the first paragraph of section 119 of this title and the treaty and the Regulations, an international application designating the United States shall be entitled to the right of priority based on a prior foreign application, or a prior international application designating at least one country other than the United States. 35 USC 119.

"(c) In accordance with the conditions and requirements of section 120 of this title, an international application designating the United States shall be entitled to the benefit of the filing date of a prior national application or a prior international application designating the United States, and a national application shall be entitled to the benefit of the filing date of a prior international application designating the United States. If any claim for the benefit of an earlier filing date is based on a prior international application which designated but did not originate in the United States, the Commissioner may require the filing in the Patent Office of a certified copy of such application together with a translation thereof into the English language, if it was filed in another language. Post, p. 692.

"§ 366. Withdrawn international application 35 USC 366.

"Subject to section 367 of this part, if an international application designating the United States is withdrawn or considered withdrawn, either generally or as to the United States, under the conditions of the treaty and the Regulations, before the applicant has complied with the applicable requirements prescribed by section 371(c) of this part, the designation of the United States shall have no effect and shall be considered as not having been made. However, such international application may serve as the basis for a claim of priority under section 365 (a) and (b) of this part, if it designated a country other than the United States. Infra.

"§ 367. Actions of other authorities: Review 35 USC 367.

"(a) Where a Receiving Office other than the Patent Office has refused to accord an international filing date to an international application designating the United States or where it has held such application to be withdrawn either generally or as to the United States, the applicant may request review of the matter by the Commissioner, on compliance with the requirements of and within the time limits specified by the treaty and the Regulations. Such review may result in a determination that such application be considered as pending in the national stage.

"(b) The review under subsection (a) of this section, subject to the same requirements and conditions, may also be requested in those instances where an international application designating the United States is considered withdrawn due to a finding by the International Bureau under article 12(3) of the treaty.

"§ 368. Secrecy of certain inventions; filing international applications in foreign countries 35 USC 368.

"(a) International applications filed in the Patent Office shall be subject to the provisions of chapter 17 of this title. 35 USC 181 et seq.

"(b) In accordance with article 27(8) of the treaty, the filing of an international application in a country other than the United States on the invention made in this country shall be considered to constitute the filing of an application in a foreign country within the meaning of chapter 17 of this title, whether or not the United States is designated in that international application.

"(c) If a license to file in a foreign country is refused or if an international application is ordered to be kept secret and a permit refused, the Patent Office when acting as a Receiving Office or International Searching Authority, or both, may not disclose the contents of such application to anyone not authorized to receive such disclosure.

"Chapter 37.—NATIONAL STAGE

"Sec.
"371. National stage: Commencement.
"372. National stage: Requirements and procedure.
"373. Improper applicant.
"374. Publication of international application: Effect.
"375. Patent issued on international application: Effect.
"376. Fees.

35 USC 371.

"§ 371. National stage: Commencement

"(a) Receipt from the International Bureau of copies of international applications with amendments to the claims, if any, and international search reports is required in the case of all international applications designating the United States, except those filed in the Patent Office.

"(b) Subject to subsection (f) of this section, the national stage shall commence with the expiration of the applicable time limit under article 22 (1) or (2) of the treaty, at which time the applicant shall have complied with the applicable requirements specified in subsection (c) of this section.

"(c) The applicant shall file in the Patent Office—

"(1) the national fee prescribed under section 376(a)(4) of this part;

"(2) a copy of the international application, unless not required under subsection (a) of this section or already received from the International Bureau, and a verified translation into the English language of the international application, if it was filed in another language;

"(3) amendments, if any, to the claims in the international application, made under article 19 of the treaty, unless such amendments have been communicated to the Patent Office by the International Bureau, and a translation into the English language if such amendments were made in another language;

"(4) an oath or declaration of the inventor (or other person authorized under chapter 11 of this title) complying with the requirements of section 115 of this title and with regulations prescribed for oaths or declarations of applicants.

35 USC 111 et seq.
35 USC 115.

"(d) Failure to comply with any of the requirements of subsection (c) of this section, within the time limit provided by article 22 (1) or (2) of the treaty shall result in abandonment of the international application.

"(e) After an international application has entered the national stage, no patent may be granted or refused thereon before the expiration of the applicable time limit under article 28 of the treaty, except with the express consent of the applicant. The applicant may present amendments to the specification, claims, and drawings of the application after the national stage has commenced.

"(f) At the express request of the applicant, the national stage of processing may be commenced at any time at which the application is in order for such purpose and the applicable requirements of subsection (c) of this section have been complied with.

"§ 372. National stage: Requirements and procedure 35 USC 372.

"(a) All questions of substance and, within the scope of the requirements of the treaty and Regulations, procedure in an international application designating the United States shall be determined as in the case of national applications regularly filed in the Patent Office.

"(b) In case of international applications designating but not originating in, the United States—

"(1) the Commissioner may cause to be reexamined questions relating to form and contents of the application in accordance with the requirements of the treaty and the Regulations;

"(2) the Commissioner may cause the question of unity of invention to be reexamined under section 121 of this title, within the scope of the requirements of the treaty and the Regulations. 35 USC 121.

"(c) Any claim not searched in the international stage in view of a holding, found to be justified by the Commissioner upon review, that the international application did not comply with the requirement for unity of invention under the treaty and the Regulations, shall be considered canceled, unless payment of a special fee is made by the applicant. Such special fee shall be paid with respect to each claim not searched in the international stage and shall be submitted not later than one month after a notice was sent to the applicant informing him that the said holding was deemed to be justified. The payment of the special fee shall not prevent the Commissioner from requiring that the international application be restricted to one of the inventions claimed therein under section 121 of this title, and within the scope of the requirements of the treaty and the Regulations.

"§ 373. Improper applicant 35 USC 373.

"An international application designating the United States, shall not be accepted by the Patent Office for the national stage if it was filed by anyone not qualified under chapter 11 of this title to be an applicant for the purpose of filing a national application in the United States. Such international applications shall not serve as the basis for the benefit of an earlier filing date under section 120 of this title in a subsequently filed application, but may serve as the basis for a claim of the right of priority under section 119 of this title, if the United States was not the sole country designated in such international application. 35 USC 111 et seq. Post, p. 692. 35 USC 119.

"§ 374. Publication of international application: Effect 35 USC 374.

"The publication under the treaty of an international application shall confer no rights and shall have no effect under this title other than that of a printed publication.

"§ 375. Patent issued on international application: Effect 35 USC 375.

"(a) A patent may be issued by the Commissioner based on an international application designating the United States, in accordance with the provisions of this title. Subject to section 102(e) of this title, such patent shall have the force and effect of a patent issued on a national application filed under the provisions of chapter 11 of this title. Post, p. 691.

"(b) Where due to an incorrect translation the scope of a patent granted on an international application designating the United States, which was not originally filed in the English language, exceeds the scope of the international application in its original language, a court of competent jurisdiction may retroactively limit the scope of the patent, by declaring it unenforceable to the extent that it exceeds the scope of the international application in its original language.

35 USC 376. "§ 376. Fees

"(a) The required payment of the international fee, which amount is specified in the Regulations, shall be paid in United States currency. The Patent Office may also charge the following fees:

"(1) A transmittal fee (see section 361(d));

"(2) A search fee (see section 361(d));

"(3) A supplemental search fee (to be paid when required);

"(4) A national fee (see section 371(c));

"(5) A special fee (to be paid when required; see section 372 (c));

"(6) Such other fees as established by the Commissioner.

"(b) The amounts of fees specified in subsection (a) of this section, except the international fee, shall be prescribed by the Commissioner. He may refund any sum paid by mistake or in excess of the fees so specified, or if required under the treaty and the Regulations. The Commissioner may also refund any part of the search fee, where he determines such refund to be warranted.".

SEC. 2. Section 6 of title 35, United States Code, is amended by adding a paragraph (d) to read as follows:

35 USC 6. "§ 6. Duties of Commissioner

* * * * * * *

"(d) The Commissioner, under the direction of the Secretary of Commerce, may, with the concurrence of the Secretary of State, allocate funds appropriated to the Patent Office, to the Department of State for the purpose of payment of the share on the part of the United States to the working capital fund established under the Patent Cooperation Treaty. Contributions to cover the share on the part of the United States of any operating deficits of the International Bureau under the Patent Cooperation Treaty shall be included in the annual budget of the Patent Office and may be transferred by the Commissioner, under the direction of the Secretary of Commerce, to the Department of State for the purpose of making payments thereof to the International Bureau.".

SEC. 3. Item 1 of section 41(a) of title 35, United States Code, is amended to read as follows:

35 USC 41. "§ 41. Patent fees

"(a) The Commissioner shall charge the following fees:

"1. On filing each application for an original patent, except in design cases, $65; in addition on filing or on presentation at any other time, $10 for each claim in independent form which is in excess of one, and $2, for each claim (whether independent or dependent) which is in excess of ten. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of this title or any claim depending therefrom shall be considered as separate dependent claims in accordance with the number of claims to which reference is made. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.".

Post, p. 691.

SEC. 4. Section 42 of title 35, United States Code, is amended to read as follows:

35 USC 42. "§ 42. Payment of patent fees; return of excess amounts

"All patent fees shall be paid to the Commissioner who, except as provided in sections 361(b) and 376(b) of this title, shall deposit the same in the Treasury of the United States in such manner as the Secretary of the Treasury directs, and the Commissioner may refund any sum paid by mistake or in excess of the fee required by law.".

Ante, p. 686, Supra.

SEC. 5. Paragraph (e) of section 102 of title 35, United States Code, is amended to read as follows:

"§ 102. Conditions for patentability; novelty and loss of right to patent 35 USC 102.

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"(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent, or".

SEC. 6. The first sentence of section 104 of title 35, United State Code, is amended to read as follows:

"§ 104. Invention made abroad 35 USC 104.

"In proceedings in the Patent Office and in the courts, an applicant for a patent, or a patentee, may not establish a date of invention by reference to knowledge or use thereof, or other activity with respect thereto, in a foreign country, except as provided in sections 119 and 365 of this title.". 35 USC 119.

SEC. 7. The second sentence of the second paragraph of section 112 of title 35, United States Code, is amended to read as follows: Ante, p. 686.

"§ 112. Specification 35 USC 112.

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"A claim may be written in independent or, if the nature of the case admits, in dependent or multiple dependent form.

"Subject to the following paragraph, a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

"A claim in multiple dependent form shall contain a reference, in the alternative only, to more than one claim previously set forth and then specify a further limitation of the subject matter claimed. A multiple dependent claim shall not serve as a basis for any other multiple dependent claim. A multiple dependent claim shall be construed to incorporate by reference all the limitations of the particular claim in relation to which it is being considered.".

SEC. 8. Section 113 of title 35, United States Code, is amended to read as follows:

"§ 113. Drawings 35 USC 113.

"The applicant shall furnish a drawing where necessary for the understanding of the subject matter sought to be patented. When the nature of such subject matter admits of illustration by a drawing and the applicant has not furnished such a drawing, the Commissioner may require its submission within a time period of not less than two months from the sending of a notice thereof. Drawings submitted after the filing date of the application may not be used (i) to overcome any insufficiency of the specification due to lack of an enabling disclosure or otherwise inadequate disclosure therein, or (ii) to supplement the original disclosure thereof for the purpose of interpretation of the scope of any claim.".

SEC. 9. Section 120 of title 35, United States Code, is amended to read as follows:

35 USC 120. **"§ 120. Benefit of earlier filing date in the United States**

"An application for patent for an invention disclosed in the manner
35 USC 112. provided by the first paragraph of section 112 of this title in an application previously filed in the United States, or as provided by section
Ante, p. 686. 363 of this title, by the same inventor shall have the same effect, as to such invention, as though filed on the date of the prior application, if filed before the patenting or abandonment of or termination of proceedings on the first application or on an application similarly entitled to the benefit of the filing date of the first application and if it contains or is amended to contain a specific reference to the earlier filed application.".

SEC. 10. The first paragraph of section 282 of title 35, United States Code, is amended to read as follows:

35 USC 282. **"§ 282. Presumption of validity; defenses**

"A patent shall be presumed valid. Each claim of a patent (whether in independent, dependent, or multiple dependent form) shall be presumed valid independently of the validity of other claims; dependent or multiple dependent claims shall be presumed valid even though dependent upon an invalid claim. The burden of establishing invalidity of a patent or any claim thereof shall rest on the party asserting such invalidity.".

Effective dates. 35 USC 351 note. SEC. 11. (a) Section 1 of this Act shall come into force on the same day as the entry into force of the Patent Cooperation Treaty with respect to the United States. It shall apply to international and national applications filed on and after this effective date, even though entitled to the benefit of an earlier filing date, and to patents issued on such applications.

(b) Sections 2 to 10 of this Act shall take effect on the same day as section 1 of this Act and shall apply to all applications for patent actually filed in the United States on and after this effective date, as well as to international applications where applicable.

(c) Applications for patent on file in the Patent Office on the effective date of this Act, and patents issued on such applications, shall be governed by the provisions of title 35, United States Code, in effect immediately prior to the effective date of this Act.

Approved November 14, 1975.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 94-592 (Comm. on the Judiciary).
SENATE REPORT No. 94-215 (Comm. on the Judiciary).
CONGRESSIONAL RECORD, Vol. 121 (1975):
June 21, considered and passed Senate.
Nov. 3, considered and passed House.

(77) TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

CHAPTER 1—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

[37 CFR Parts 1, 3 and 5]

IMPLEMENTATION OF PATENT COOPERATION TREATY

Notice of Proposed Rulemaking

Notice is hereby given that, pursuant to the authority contained in Section 6, Title 35 of the United States Code, and Pub. L. 94–131, 89 Stat. 685, of November 14, 1975 which will come into force on the same day as the entry into force of the Patent Cooperation Treaty, the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by either amending or revising sections 1.1, 1.4, 1.5, 1.8, 1.12, 1.14, 1.21, 1.23, 1.25, 1.26, 1.52, 1.55, 1.57, 1.58, 1.72, 1.75, 1.77, 1.78, 1.81, 1.83, 1.84, 1.104, 1,141, 1.146, 1,331, 5.1, 5.3, 5.11, 5.14, 5.15 and 5.17; and by adding new sections 1.9, 1.61, 1.70, 1.318, 1.401, 1.412, 1.413, 1.414, 1.415, 1.421, 1.422, 1.423, 1.424, 1.425, 1.431, 1.432, 1.433, 1.434, 1.435, 1.436, 1.437, 1.438, 1.445, 1.446, 1.451, 1.455, 1.461, 1.465, 1.468, 1.471, 1.475, 1.481, 1.482, 3.56 and 3.57.

In view of the approaching entry into force of the Patent Cooperation Treaty, the Patent and Trademark Office is proposing certain amendments to the rules of practice in patent cases, forms for patent cases and the rules relating to secrecy of certain inventions and licenses to file applications in foreign countries. These proposed rules provide for the formal acceptance of international applications filed under the Patent Cooperation Treaty in the Patent and Trademark Office as a Designated Office, establish processing fees for international applications, clarify procedures before the Receiving Office and International Search Authority, and provide for other matters relating to the filing and processing of international applications.

All persons are invited to present their views, objections, recommendations or suggestions relating to the proposed rule changes to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 on or before May 26, 1977 on which date a hearing will be held at 9:30 a.m. in Room 11C24, Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia. All persons wishing to be heard orally at the hearing are requested to notify the Commissioner of Patents and Trademarks of their intended appearance. All comments received will be available for public inspection in Room 11E10 of Building 3, at 2021 Jefferson Davis Highway, Arlington, Virginia. If the Patent Cooperation Treaty implementation schedule permits the period for comments may be extended. It is also possible that a further draft will be published for comment.

The proposed rules will not be promulgated until the Patent Cooperation Treaty and Public Law 94–131, 89 Stat. 685 come into force. This will occur three months after the necessary eight ratifications or accessions to the Treaty have occurred, four of which must be countries with major patent activity, PCT Article 63. The United States of America and the Federal Republic of Germany are two of the four major countries which have ratified the Treaty. Two additional major countries must yet ratify or accede to the Treaty before it can enter into force.

This proposal has been reviewed pursuant to E.O. 11821 and OMB Circular A–107 and determined to have no major inflationary impact.

The Patent Cooperation Treaty was published in the OFFICIAL GAZETTE on July 14, 1970 at 876 O.G. 341–388. The implementing legislation, Public Law 94–131, was published in the OFFICIAL GAZETTE on January 6, 1976 at 942 O.G. 177–185. The latest draft of the Administrative Instructions to be promulgated under Rule 89 of the Treaty by the World Intellectual Property Organization is being published in an OFFICIAL GAZETTE in January of 1977.

The following comments are directed to the proposed changes and additions in the Patent Rules of Practice.

In order to distinguish which rules apply to national applications, which to international applications, and which to both, it is being proposed that Part I of 37 CFR be divided into 3 subparts. Subpart A would relate to "General Provisions" directed to both national applications and international applications and would include §§ 1.1 through 1.26. Subpart B would relate to "National Processing Provisions" directed to national applications only, and would include §§ 1.31 through 1.352. Subpart C would relate to "International Processing Provisions" under the Patent Cooperation Treaty and would include proposed new §§ 1.401 through 1.482. Within each subpart, where an exception as to the applicability of a rule to national and/or international applications occurs, a specific clarifying reference has been added. In all cases, the present numbering of rules has been maintained.

Section 1.1 provides a special "Box PCT" address to permit an early separation and routing of PCT related mail from other types of mail.

Section 1.4(a) is amended to refer to the added rules relating to international processing.

Section 1.5(a) is amended to indicate that international applications are to be identified by their international application numbers.

Section 1.8(a) is amended to exclude international applications and papers relating thereto from the certificate of mailing procedure.

New section 1.9 is added to distinguish between the terms "national application" and "international application" as used in these rules.

Section 1.12 is amended to refer specifically to the international application number.

Section 1.14(a) indicates the current practice as to application secrecy and also refers specifically to applications identified in international applications. Section 1.14(c) changes the reference from Atomic Energy Commission to the Energy Research and Development Administration.

An international-type search will be made in all national applications as indicated in § 1.104(c). New paragraph (w) to § 1.21 adds a fee to cover the cost of preparing an international-type search report where desired (PCT Art. 15(5)), although it is not required by the United States Patent and Trademark Office.

Section 1.23 includes a reference to international application processing fees to clearly indicate that such fees must be paid in United States currency.

Section 1.25(b) is amended to indicate that international application fees may be charged against deposit accounts.

Section 1.26 is amended to provide for refunding some portion of the international search fee during subsequent national examination where the prior art search is wholly or partly based on the earlier international search. The amount of the refund will be determined by the examiner in a manner similar to that indicated in the remarks directed to § 1.446 below. Such a refund will tend to make applicants' cost of using the PCT about the same regardless of whether the national or international application is filed initially.

In section 1.52, paragraphs (a) and (b) are amended to permit an application complying with the formal requirements of PCT Rule 11 to be formally acceptable as a national application. International applications arriving in the Patent and Trademark Office as a Designated Office under 35 U.S.C. 371 will be in PCT format and with the changed wording of this rule, will also be formally acceptable for national patentability examination.

Section 1.55 is amended to contain an additional paragraph (d) which states the position set forth in PCT Art. 11(3) and 35 U.S.C. 363 that the international filing date is in effect the national filing date except for the reservation under PCT Art. 64(4). This reservation was taken by the United States of America at the time it deposited its instrument of ratification.

Section 1.57 is amended to indicate that the signature on the Request of an international application will be accepted as the signature on the application.

Section 1.58 is amended slightly to remove any conflict with the formal requirements of the Patent Cooperation Treaty.

Section 1.61 is a new section which relates to the filing of an international application with the Patent and Trademark Office as a Designated Office for national patentability examination (35 U.S.C. 371). These requirements differ somewhat from those applying to the regular filing of national applications.

Section 1.70 is a new section which sets forth the requirements of an oath or declaration under 35 U.S.C. 371(c)(4).

Section 1.72 is amended to indicate that the abstract must be located on a separate sheet of paper. This change has been introduced in order to assure uniformity in information placement in international and regular applications that will aid

in patent printing. Except for this change, national applications may continue to be filed in the present format.

Section 1.75, paragraph (c), is amended to provide for multiple dependent claims (PCT Rule 6.4). Paragraphs (f) and (g) have been added to incorporate current practice not previously stated in the rules.

Sections 1.77 and 1.78 have been amended to indicate the preferred order of arrangement of application elements including placement of the abstract after the claims as in PCT Art. 3(2) and Section 208 of the Administrative Instructions.

Section 1.81 is amended to reflect the changes made in 35 U.S.C. 113 by Public Law 94–131 and to comply with PCT Rule 7.2.

Section 1.83 has been amended to remove the mandatory requirement that the drawing show every feature claimed. Such illustrations, however, continue to be strongly preferred and are absolutely essential where necessary for the understanding of the invention.

Section 1.84, which relates to the formal requirements for drawings, has been amended to provide for two alternative drawing sizes. One size is that currently in use and the other is the A4 size required by PCT Rule 11. However, all drawings in a particular application must be of the same size. Other changes have been incorporated to take into consideration the requirements of PCT Rule 11.

Section 1.104 is amended to include a new paragraph (c) relating to the international-type search. Note PCT Art. 15(5) and PCT Rule 41.

Section 1.141 has been amended to provide for including in a single application, inventions so linked as to form a single general inventive concept as in PCT Rule 13.1–13.3.

The rules for determining which inventions can be grouped together in a single application are more liberal in certain respects under the Patent Cooperation Treaty than they are currently in 37 CFR 1.141–1.146. The proposed amendment to Section 1.141 extends the more liberal practice, which a Designated Office is required to apply to national applications that have been initially filed as international applications, to all national applications. Paragraph (a) removes the limit of five species of an invention. Paragraphs 1.141(c)(i) and (ii) generally include the wording of PCT Rule 13.2. Paragraphs 1.141(c)(i) and (d), taken together, state that an application may include, in addition to an allowable independent claim to a product, *one* independent claim to *one* process specially adapted for the manufacture of the product as well as *one* independent claim for *one* use of the product. Paragraphs 1.141(c)(ii) and (d), taken together state that an application may include, in addition to an allowable independent claim for a given process, one independent claim for one apparatus or means for carrying out the process. Such claims drawn to product, process of manufacture, process of use, or apparatus, are considered to be claims to different categories. Paragraph 1.141(e) includes generally the wording of PCT Rule 13.3 and is limited to applications where all of the claims are drawn to only one category.

Section 1.146 follows the revised wording of section 1.141 by removing the limit of five species and also removes the reference to a search of the generic claims.

Section 1.318 is a new section relating to the Office's notifying the International Bureau of the publication of a United States patent based on an unpublished international application in accordance with PCT Rule 48.5.

Paragraphs (a) and (c) of section 1.331 are amended to provide for recording of assignments of international applications which designate the United States of America.

Sections 1.401–1.482 relate to processing of international applications during the international processing stage when the United States Patent and Trademark Office acts as a Receiving Office, International Searching Authority or a Designated Office prior to the acceptance of the international application as a national application for regular patentability examination.

Section 1.401 defines various expressions used in later rules.

Section 1.412 defines those applicants for which the United States Patent and Trademark Office will act as a Receiving Office and also sets forth the major functions of a Receiving Office.

Section 1.413 states that the United States Patent and Trademark Office will act as an International Searching Authority, subject to special agreement and appointment by the Assembly, and indicates some of the major functions thereof.

Section 1.414 states the conditions under which the United States Patent and Trademark Office will act as a Designated Office and defines the functions of the Office as a Designated Office.

Section 1.415 is included to clearly define the authority acting as the International Bureau.

Section 1.421 indicates who may file an international application with the United States Receiving Office.

Sections 1.422, 1.423 and 1.425 are similar to present §§ 1.42, 1.43 and 1.47 and have been added to indicate situations where a person other than the inventor may file an international application designating the United States. These situations include those where the inventor is dead, insane or legally incapacitated, cannot be found or reached, or refuses to sign.

Section 1.431 defines the requirements of an international application filed in the United States Receiving Office.

Section 1.432 relates to the designation of States and the payment of designation fees.

Section 1.433 indicates that only one copy of an international application need be filed and refers to those provisions of the Treaty and Administrative Instructions relating to the physical requirements for international applications.

Section 1.434 relates to the Request portion of an international application.

Section 1.435 calls attention to the PCT Rules relating to the description and also provides that international applications designating the United States must contain an indication of the "best mode" (PCT Rule 5.1(a)(v)).

Section 1.436 refers to the portions of the Treaty and its Regulations which relate to claims.

Section 1.437 relates to the drawings and includes reference to the procedure for receipt of late drawings.

Section 1.438 refers to the abstract requirements of an international application.

Section 1.445 sets forth the fees charged by the Patent and Trademark Office for processing international applications. The amounts of the fees are tentative. More complete and updated studies will be made before these rule changes are finally promulgated and the amounts of the fees will be adjusted accordingly. The fees will be set to reflect 100% recovery of actual cost.

Section 1.446 relates to refund of international application processing fees. It should be noted that since an international-type search will be made in prior filed U.S. national applications or, if an international search made in an international application by the International Searching Authority of Washington is followed by a national examination on such an application, a substantial portion of the international search fee (37 CFR 1.445(a)(2)) could be refunded in many instances. This refund will reduce PCT filing costs.

The examples use the maximum refund and should therefore not be considered to be typical for all applications.

	(A) National application filed first	(B) International application filed first
National filing fee for national application (35 U.S.C. 41)	$65	----------
Transmittal fee (§ 1.445(a)(1))	35	$35
International fees:		
Basic fee (PCT Rule 15.2(a))	45	45
Designation fees, 3 countries (PCT Rule 15.2(b)(i)	36	36
Search fee (§ 1.445(a)(2))	300	300
(Search fee refund based on international type search § 1.446.)	(−270)	----------
National filing fee (§ 1.445(a)(4))	----------	65
(Refund of search fee based on savings at national stage (§ 1.26))	----------	(−$270)
Net international processing fees	146	146

The first fee column, labeled (A), relates to a situation where an applicant first files his national application in the Patent and Trademark Office and later, within the priority year, decides to file an international application with the same claims and designates 3 foreign countries. The total fees for the international application in the example would be $416. However, since the claims are the same as those in the national application in which the Office previously made an international-type search, a refund of $270 would be made

as indicated in the table below. This would result in the PCT route fees actually costing the applicant $146.

The second fee column, labeled (B), relates to a situation in which the applicant files his international application initially and designates the United States of America as one of the Designated States. Here again the international application fees would be $416. Subsequently, not later than at the expiration of 20 months from the priority date (in this example the international filing date, PCT Art. 2(xi)(c)), the applicant must pay his national fees in the Designated Offices (PCT Art. 22.1). The Patent and Trademark Office, as a Designated Office, may refund during patentability examination a portion of the international search fee under § 1.26. This practice will result in the total cost to the applicant being about the same regardless of whether the national or international application is filed first.

The following table is a draft of the criteria which the examiners may use to determine the amount of the international search fee which may be refunded as a result of an earlier international-type search. Similar criteria will be used for refunds under § 1.26. Current plans are to have the examiner making the international search merely indicate which category most nearly describes the situation in the application under consideration.

CRITERIA FOR REFUND

	Refund percentage of search fee	Refund based on $300 search fee
A. The prior international-type search was so complete that only an updating search was required	90	$270
B. The prior international-type search was directed to substantially the same invention. However, the claims in the international vary from the national application so that a search in at least one additional subclass but less than three additional subclasses is required	70	210
C. The prior international-type search was such that about a half of the search time of the international search was saved	40	120
D. The prior international-type search was of only small value. The claims of the international application were so different from the claims in the prior national application that the search of only a few subclasses was saved	25	75
E. The prior international-type search was of no value	0	(1)

[1] No refund.

Section 1.451 indicates the procedures to be used to file certified copies of priority documents. Paragraph (b) includes a procedure by which the Office will automatically forward a copy of the priority document to the International Bureau if a fee for copy preparation and a request for such service is filed with the international application.

Section 1.455 relates to who may act as applicant's representative in an international application, and indicates the International Authority to which powers of attorney and revocations thereof should be sent.

Section 1.461 covers the procedures for transmittal of the record copy to the International Bureau. It should be noted that the alternative procedure in paragraph (b) requires that applicants electing transmittal of the international application by themselves rather than by the Receiving Office must file such applications before the expiration of 11 months from the priority date to permit sufficient time for the Receiving Office to process the applications before transmittal by the applicant takes place.

Section 1.465 relates to the time limits for processing based on the priority date that are set by the Treaty and its Regulations. This rule indicates which date is to be used if the original claimed priority date is either canceled or changed.

Section 1.468 refers to excusing failures to meet time limits during international processing.

Section 1.471 covers procedures for correcting or amending international applications.

Section 1.475 indicates to which International Authority changes in person, name or address of the applicant or inventor should be sent during various processing stages.

Section 1.481 relates to the International Searching Authority's finding a lack of unity of invention (multiple inventions) under PCT Rule 13 and the resulting invitation to pay additional fees. This section also relates to the filing of a protest on a holding of lack of unity of invention and the payment of additional fees.

Section 1.482 indicates that the International Searching Authority may determine the novelty and obviousness of generic or linking claims to decide if such claims properly link claims to different inventions.

PART 3

Sections 3.56 and 3.57 are proposed as oath and declaration forms which may be used when filing an international application with the United States Designated Office under 35 U.S.C. 371(c)(4).

PART 5

Section 5.1 relates to inspection of applications by defense agencies. Paragraph (a) indicates that the provisions of Part 5 apply to both national and international applications except as otherwise specifically indicated and that the filing of an international application designating a foreign country is considered to be a "foreign filing." In paragraph (b) Atomic Energy Commission is changed to the Energy Research and Development Administration.

Paragraph (d) of § 5.3 is added to indicate that the record and search copies will not be forwarded to the Authorities or delivered to the applicant if the international application is under secrecy order.

Sections 5.11, 5.14, 5.15 and 5.17 indicate that a license for filing an international application which designates a foreign country is required in the same manner as a license to file a foreign application directly in a foreign country.

The following table of contents indicates the contents of the proposed Subparts and the location of added sections and section headings.

PART I—RULES OF PRACTICE IN PATENT CASES

SUBPART A—GENERAL PROVISIONS

(§§ 1.1–1.26)

General Information and Correspondence

* * *

§ 1.9 *Definitions.*

* * * * *

SUBPART B—NATIONAL PROCESSING PROVISIONS

(§§ 1.31–1.352)

* * * * *

The Application

* * *

§ 1.61 Filing of applications in the United States of America as a Designated Office.

Statement; Oath or Declaration

* * *

§ 1.70 Content of oath or declaration relating to content of and amendments to an application under 35 U.S.C. 371(c)(4).

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Allowance and Issue of Patent

* * *

§ 1.318 Notification of national publication of a patent based on an international application.

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SUBPART C—INTERNATIONAL PROCESSING PROVISIONS

General Information

§ 1.401 Definitions of Terms under the Patent Cooperation Treaty.
§ 1.412 The United States Receiving Office.
§ 1.413 The International Searching Authority of Washington.
§ 1.414 The United States Designated Office.
§ 1.415 The International Bureau.

Who May File an International Application

§ 1.421 Applicant for international application.
§ 1.422 When the inventor is dead.
§ 1.423 When the inventor is insane or legally incapacitated.
§ 1.424 Joint Inventors.
§ 1.425 Filing by other than inventor.

The International Application

§ 1.431 International application requirements.
§ 1.432 Designation of States and payment of designation fees.
§ 1.433 Physical requirements of international application.
§ 1.434 The Request.
§ 1.435 The Description.
§ 1.436 The Claims.
§ 1.437 The Drawings.
§ 1.438 The Abstract.

Fees

§ 1.445 International application filing and processing fees.
§ 1.446 Refund of international application filing and processing fees.

Priority

§ 1.451 The priority claim and priority document in an international application.

Representation

§ 1.455 Representation in international applications.

Transmittal of Record Copy

§ 1.461 Procedures for transmittal of Record Copy to the International Bureau.

Timing

§ 1.465 Timing of application processing based on the priority date.
§ 1.468 Delays in meeting time limits.

Amendments

§ 1.471 Corrections and amendments during international processing.
§ 1.475 Changes in person, name, or address of applicants and inventors.

Unity of Invention

§ 1.481 Unity of invention.
§ 1.482 Holding of lack of unity of invention.

PART 3—FORMS FOR PATENT CASES

* * *

§ 3.56 Oath to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).
§ 3.57 Declaration to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).

The texts of the proposed amendments are as follows (additions are indicated by arrows; deletions are bracketed):

PART 1—RULES OF PRACTICE IN PATENT CASES

1. By revising §1.1 to read as follows:

§ 1.1 *All communications to be addressed to Commissioner of Patents and Trademarks.*

All letters and other communications intended for the Patent and Trademark Office must be addressed to "Commissioner of Patents and Trademarks," Washington, D.C. 20231. When appropriate, a letter [may] ►should also◄ be marked for the attention of a particular officer or individual.

►Letters and other communications relating to international applications during the international stage and prior to the assignment of a national serial number should be additionally marked "Box PCT."◄

NOTE: §§ 1.1 to 1.26 are applicable to trademark cases as well as to ►national and international◄ patent cases except for provisions specifically directed to patent[s] ►cases◄. ►See § 1.9 for definitions of "national application" and "international application."◄

2. By revising paragraph (a) of § 1.4 to read as follows:

§ 1.4 *Nature of correspondence.*

(a) Correspondence with the Patent and Trademark Office comprises (1) correspondence relating to services and facilities of the Office, such as general inquiries, requests for publications supplied by the Office, orders for printed copies of patents or trademark registrations, orders for copies of records, transmission of assignments for recording, and the like, and (2) correspondence in and relating to a particular application or other proceeding in the Office. See particularly the rules relating to the filing ►, processing,◄ [and prosecution of applications] or other proceedings [(] ►of national applications in Subpart B,◄ §§ 1.31 to 1.352 ►; of international applications in Subpart C, §§ 1.401–1.482;◄ and ►of trademark applications,◄ §§ 2.11 to 2.189[)].

* * * * *

3. By revising paragraph (a) of § 1.5 to read as follows:

§ 1.5 *Identification of application, patent or registration.*

(a) When a letter concerns an application for patent, it should state the name of the applicant, the title of the invention, the serial number ►or international application number◄ of the application, the date of filing the same, and, if known, the group art unit and name of the examiner to which it has been assigned (see § 1.55).

* * * * *

4. By revising paragraphs (a)(i) and (xi) of § 1.8 to read as follows:

§ 1.8 *Certificate of mailing.*

(a) Except in the cases enumerated below, papers and fees required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if (1) they are addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and deposited with the United States Postal Service with sufficient postage as first class mail prior to expiration of the set period, and (2) they are accompanied by a certificate stating the date of deposit (see forms, §§ 3.55 and 4.23). The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed on or before the date indicated. The actual date of receipt of the paper or fee will be used for all other purposes. This procedure does not apply to the following:

(i) The filing of ►national◄ applications ►for patent◄;

* * *

►(xi) The filing of international applications for patent and papers relating thereto.◄

* * * * *

5. A new section 1.9 is added to read as follows:

►§ 1.9 *Definitions.*◄

►(a) A national application as used in this Chapter means a United States national application for patent which was either filed in the Office under 35 U.S.C. 111 or which resulted from an international application after compliance with 35 U.S.C. 371.◄

►(b) An international application as used in this Chapter means an international application for patent filed under the Patent Cooperation Treaty prior to entering national processing at the Designated Office stage.◄

6. By revising § 1.12 to read as follows:

§ 1.12 *Assignment records open to public inspection.*

The assignment records, relating to original or reissue patents, including digests and indexes, are open to public inspection and copies of any instrument recorded may be obtained upon payment of the fee therefor. Assignment records, digests and indexes, relating to any pending or abandoned application are not available to the public. Copies of any such assignment records and information with respect thereto shall be obtainable only upon written authority of the applicant or his assignee or attorney or agent or upon a showing that the person seeking such information is a bona fide prospective or actual purchaser, mortgagee or licensee of such application, unless it shall be necessary to the proper conduct of business before the Office or as provided by these rules. An order for a copy of an assignment should give the identification of the record. If identified only by the name of the patentee and number of the patent, or in the case of a trademark registration by the name of the registrant and number of the registration, or by name of the applicant and serial number ►or international application number◄ of the

application, an extra charge will be made for the time consumed in making a search for such assignment.

7. By revising paragraphs (a) and (c) of § 1.14 to read as follows:

§ 1.14 *Patent applications preserved in secrecy.*

(a) Except as provided in § 1.11(b) pending patent applications are preserved in secrecy. No information will be given by the Office respecting the filing by any particular person of an application for a patent, the pendency of any particular case before it, or the subject matter of any particular application, nor will access be given to or copies furnished of any pending application or papers relating thereto, without written authority in that particular application from the applicant or his assignee or attorney or agent of record, ►unless the application has been identified by serial number in a published patent document or the United States of America has been indicated as a designated state in a published international application, in which case status information such as whether it is pending, abandoned or patented may be supplied, or◄ unless it shall be necessary to the proper conduct of business before the Office or as provided by this part. ►Where an application has been patented, the patent number and issue date may also be supplied.◄

* * * * *

(c) Applications for patents which disclose, or which appear to disclose, or which purport to disclose, inventions or discoveries relating to atomic energy are reported to the ►Energy Research and Development Administration◄ [Atomic Energy Commission] and the [Commission] ►Administration◄ will be given access to such applications, but such reporting does not constitute a determination that the subject matter of each application so reported is in fact useful or an invention or discovery or that such application in fact discloses subject matter in categories specified by secs. 151(c) and 151(d) of the Atomic Energy Act of 1954, 68 Stat. 919; 42 U.S.C. 2181.

* * * * *

8. By adding a new paragraph (w) to § 1.21 to read as follows:

§ 1.21 *Patent and miscellaneous fees and charges.*

* * * * *

►(w) For preparing an international-type search report in a national patent application ---------- $25.00.

NOTE: For fees relating to processing of international applications, see § 1.445.◄

9. By revising § 1.23 to read as follows:

§ 1.23 *Method of payment.*

All payments of money required for Patent and Trademark Office fees►, including fees for the processing of international applications (§ 1.445),◄ should be made in United States specie, Treasury notes, national bank notes, post office money orders, or by certified check. If sent in any other form, the Office may delay or cancel the credit until collection is made. Money orders and checks must be made payable to the Commissioner of Patents and Trademarks. Remittances from foreign countries must be payable and immediately negotiable in the United States for the full amount of the fee required. Money sent by mail to the Patent and Trademark Office will be at the risk of the sender; letters containing money should be registered.

10. By revising paragraph (b) of § 1.25 to read as follows:

§ 1.25 *Deposit accounts.*

* * * * *

(b) Filing, issue, appeal, ►international-type search report, international application processing,◄ and petition fees may be charged against these accounts.

11. By revising § 1.26 to read as follows:

§ 1.26 *Refund.*

Money paid by actual mistake or in excess, such as a payment not required by law, will be refunded, but a mere change of purpose after the payment of money, as when a party desires to withdraw his application or to withdraw an appeal, will not entitle a party to demand such a return. ►Refund of a portion of any international search fee paid to the Patent and Trademark Office may be made where the prior art search made during the subsequent national examination of that application is wholly or partly based on the earlier international search made in the international application for which the search fee was paid. The amount of the refund will be as determined by the examiner according to the value of the prior international search made by the Patent and Trademark Office as an International Searching Authority, as 90%, 70%, 40%, 25% or 0% of the international search fee. If the amount of the refund is not a multiple of $10, it will be rounded off to the next higher multiple of $10. (Note § 1.446 for refund of the search fee in an international application.)◄ Amounts of ten cents or less will not be returned unless specifically demanded, within a reasonable time, nor will the payer be notified of such amount; amounts over ten cents but less than one dollar may be returned in postage stamps, and other amounts by check.

12. By revising paragraphs (a) and (b) of § 1.52 to read as follows:

§ 1.52 *Language, paper, writing, margins.*

(a) The ►application, any papers pertaining thereto, any amendments and the◄ [specification and] oath or declaration must be in the English language ►or be accompanied by a verified translation of the application and a translation of any other papers into the English language◄. All papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly written ►, typed,◄ or printed in permanent ink or its equivalent in quality. All of the application papers must be presented in a form having sufficient clarity and contrast between the paper and the writing►, typing,◄ or printing thereon to permit the ►direct◄ production of readily legible copies in any number by use of photographic, electrostatic, photooffset, and microfilming processes. If the papers are not of the required quality, substitute typewritten or printed papers of suitable quality may be required.

(b) The application papers (specification, including claims, ►abstract,◄ oath[,] or declaration, ►and◄ papers as provided for in §§ 1.42, 1.43, 1.47, etc.) and also papers subsequently filed, must be plainly written on but one side of the paper. The size of all sheets of paper should be 8 to 8½ by 10½ to 13 inches (20.3 to 21.6 cm. by 26.6 to 33.0 cm.). A margin of ►at least approximately one inch (2.5 cm.)◄ [1½ inches (3.8 cm.)] must be reserved on the left-hand side ►of each page. The◄ [and on the] top of each page of the ►application◄ [specification], including claims ►must have a margin of at least approximately ¾ inch (2 cm.)◄. The lines ►of text◄ must not be crowded too closely together; typewritten lines should be ►1½ or◄ double spaced. The pages of the ►application◄ [specification], including claims ►and abstract◄, should be numbered consecutively, starting with 1, the numbers being ►centrally located above or preferably, below, the text◄ [placed in the center of the bottom margins].

* * * * *

13. By adding paragraph (d) to § 1.55 to read as follows:

§ 1.55 *Serial number and filing date of application.*

* * * * *

►(d) The filing date of an international application designating the United States of America shall be treated as the filing date in the United States of America under PCT Article 11(3), except provided in 35 U.S.C. 102(e).◄

14. By revising § 1.57 to read as follows:

§ 1.57 *Signature.*

►(a)◄ The application must be signed by the applicant in person. The signature to the oath or declaration ►under § 1.65◄ will be accepted as the signature to the application provided the oath or declaration ►under § 1.65◄ is attached to and refers to the specification and claims to which it applies. Otherwise the signature must appear at the end of the specification after the claims.

►(b) The signature to the oath or declaration under § 1.70 will be accepted as the signature to the application provided the oath or declaration under § 1.70 specifically refers to the specification and claims to which it applies.◄

►(c)◄ Full names must be given, including at least one given name without abbreviation together with any other given name or initial.

15. By revising § 1.58 to read as follows:

§ 1.58 *Chemical and mathematical formulas and tables.*

(a) The specification, including the claims, may contain chemical and mathematical formulas, but shall not contain drawings or flow diagrams. The description portion of the specification may contain tables; claims may contain tables ►either◄ [only] if necessary to conform to 35 U.S.C. 112 ►or if otherwise found to be desirable◄.

(b) All tables and chemical and mathematical formulas in the specification, including claims, and amendments thereto, must be on ►paper which is flexible, strong, white, smooth, non-shiny and durable◄ [pure white durable paper, the surface of which is calendered and smooth], in order to permit use as camera copy when printing any patent which may issue. A good grade of bond paper is acceptable; watermarks should not be prominent. India ink or its equivalent, or solid black typewriter ribbon ►should◄ [must] be used to secure perfectly ►dark◄ [black] solid lines.

(c) To facilitate camera copying when printing, the width of formulas and tables as presented should be limited normally to 5 inches (12.7 cm.) so that it may appear as a single column in the printed patent. If it is not possible to limit the width of a formula or table to 5 inches (12.7 cm.), it is permissible to present the formula or table with a maximum width of 10¾ inches (27.3 cm.) and to place it sideways on the sheet [, in which case the formula or table will appear printed across both columns of the page in the printed patent]. Typewritten characters used in such formulas and tables must be from a block (nonscript) type font or lettering style having capital letters which are at least ►0.08◄ [0.085] inch ►(2.1 mm.)◄ [(2.2 mm.)] high (e.g. elite type). Hand lettering must be neat, clean, and have a minimum character height of ►0.08◄ [0.085] inch ►(2.1 mm.)◄ [(2.2 mm.)]. A space at least ¼ inch (6.4 mm.) high should be provided between the formulas and tables and the text. Tables should have the lines and columns of data closely spaced to conserve space, consistent with high degree of legibility.

16. By adding a new § 1.61 to read as follows:

►§ 1.61 *Filing of application in the United States of America as a Designated Office.*◄

►(a) To maintain the benefit of the international filing date, the applicant shall furnish to the United States Patent and Trademark Office a copy of the international application with any amendments, unless it has been previously furnished by the International Bureau or unless it was originally filed in the United States Patent and Trademark Office, a verified translation of the international application and a translation of any amendments into the English language if originally filed elsewhere in another language, the national fee (see § 1.445(a)(4)) and an oath or declaration of the inventor (see § 1.70) not later than the expiration of 20 months from the priority date.◄

►(b) Where an International Searching Authority has made a declaration that no international search report will be established because the international application relates to subject matter which it is not required to search, or because the application fails to comply with the prescribed requirements to such an extent that a meaningful search could not be carried out, the time for performing the acts referred to in paragraph (a) of this section is two months from the mailing date of the declaration to the applicant.◄

17. By adding a new § 1.70 to read as follows:

►§ 1.70 *Content of oath or declaration relating to content of and amendments to an application under 35 U.S.C. 371(c)(4).*◄

►(a)(1) When an applicant of an international application, if the inventor, desires to enter the national stage under 35 U.S.C. 371, he must specifically identify the international application and any amendments thereto and state that he verily believes himself to be the original and first inventor or discoverer of the process, machine, manufacture, composition of matter, or improvement thereof, for which he solicits a patent; that he does not know and does not believe that the same was ever known or used in the United States of America before his invention or discovery thereof, and shall state of what country he is a citizen and where he resides and whether he is a sole or joint inventor of the invention claimed in his international application as filed or as amended. In every application the applicant must distinctly state that to the best of his knowledge and belief the invention has not been in public use or on sale in the United States of America more than one year prior to his international application, or patented or described in any printed publication in any country before his invention or more than one year prior to his international application, or patented or made the subject of an inventor's certificate in any foreign country prior to the date of his international application on an application filed by himself or his legal representatives or assigns more than twelve months prior to his international application. He shall state whether or not any application for patent or inventor's certificate on the same invention has been filed in any foreign country, either by himself, or by his legal representatives or assigns. If any such application has been filed, the applicant shall name the country in which the earliest such application was filed, and shall give the day, month, and year of its filing; he shall also identify by country and by day, month, and year of filing, every such foreign application filed more than twelve months before the filing of the international application.◄

►(2) This statement (i) must be subscribed to by the applicant, and (ii) must either (a) be sworn to (or affirmed) as provided in § 1.66, or (b) include the personal declaration of the applicant as prescribed in § 1.68.◄

►(b) If the international application was made as provided in §§ 1.422, 1.423 or 1.425, the applicant shall state his relationship to the inventor and, upon information and belief, the facts which the inventor is required by this section to state.◄

18. By revising paragraph (b) of § 1.72 to read as follows:

§ 1.72 *Title and abstract.*

* * * * *

(b) A brief abstract of the technical disclosure in the specification must be set forth ►on a separate sheet, preferably following the claims◄ [immediately following the title and preceding the disclosure in a separate paragraph] under the heading "Abstract of the Disclosure." The purpose of the abstract is to enable the Patent and Trademark Office and the public generally to determine quickly from a cursory inspection the nature and gist of the technical disclosure, and the abstract shall not be used for interpreting the scope of the claims.

19. By revising paragraph (c) of § 1.75 and adding paragraphs (f) and (g) as follows:

§ 1.75 *Claim(s).*

* * * * *

(c) ►One or more claims may be presented in dependent form, referring back to another claim or claims in the same application. Any dependent claim which refers to more than one other claim ("multiple dependent claim") shall refer to such other claims in the alternative only. A multiple dependent claim shall not serve as a basis for any other multiple dependent claim.◄ [When more than one claim is presented, they may be placed in dependent form in which a claim may refer back to and further restrict a single preceding claim]. Claims in dependent form shall be construed to include all the limitations of the claim incorporated by reference into the dependent claim. ►A multiple dependent claim shall be construed to incorporate by reference all the limitations of the particular claim in relation to which it is being considered.◄

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►(f) If there are several claims, they shall be numbered consecutively in Arabic numerals.◄

►(g) All dependent claims referring back to a single previous claim, and all dependent claims referring back to several previous claims, should be grouped together to the extent possible.◄

20. By revising § 1.77 to read as follows:

§ 1.77 *Arrangement of application ►elements◄.*

The ►elements of the application should appear in the following order◄ [following order of arrangement should be observed in framing the application]:

(a) Title of the invention; or an introductory portion

stating the name, citizenship, and residence of the applicant, and the title of the invention may be used.

(b) [Abstract of the disclosure.] ►(reserved)◄

(c) Cross-references to related application, if any.

(d) Brief summary of the invention.

(e) Brief description of the several views of the drawing, if there are drawings.

(f) Detailed description.

(g) Claim or claims.

(h) Signature. (See § 1.57.)

►(i) Abstract of the disclosure.◄

►(j) Drawings.◄

21. By revising paragraph (a) of § 1.78 to read as follows:

§ 1.78 *Cross-references to other applications.*

(a) When an applicant files an application claiming an invention disclosed in a prior filed copending ►national◄ application ►or international application designating the United States of America◄ of the same applicant, the second application must contain or be amended to contain in the first sentence of the specification following the title [and abstract] a reference to [the] ►such◄ prior application, identifying it by serial number and filing date ►or international application number and international filing date◄ and indicating the relationship of the applications, if the benefit of the filing date of [the] ►such◄ prior application is to be claimed. Cross-references to other related applications may be made when appropriate. (See §1.14(b).)

* * * * *

22. By revising §1.81 to read as follows:

§ 1.81 *Drawings required.*

►(a)◄ The applicant for patent is required by statute to furnish a drawing of his invention ►where necessary for the understanding of the subject matter sought to be patented;◄ [whenever the nature of the case admits of it;] this drawing must be filed with the application.

►(b)◄ Illustrations facilitating an understanding of the invention (for example, flow sheets in cases of processes, and diagrammatic views) may also be furnished in the same manner as drawings [and may be required by the Office when considered necessary or desirable].

►(c) When a drawing or illustration is not necessary for, but would facilitate, the understanding of the subject matter sought to be patented and the applicant has not furnished such a drawing or illustration, the Office may require its submission within a time period of not less than two months from the sending of a notice thereof.◄

23. By revising § 1.83 to read as follows:

§ 1.83 *Content of drawing.*

(a) The drawing ►should preferably◄ [must] show every feature of the invention specified in the claims. [However,] Conventional features disclosed in the description and claims, where their detailed illustration is not essential for a proper understanding of the invention, should be illustrated in the drawing in the form of a graphical drawing symbol or a labeled representation (e.g., a labeled rectangular box).

(b) When the invention consists of an improvement on an old machine the drawing ►should◄ [must] when possible exhibit, in one or more views, the improved portion itself, disconnected from the old structure, and also in another view, so much only of the old structure as will suffice to show the connection of the invention therewith.

24. By revising paragraphs (a), (b), (c), (d), (e), (f), (i), (j) and (l) of § 1.84 to read as follows:

§ 1.84 *Standards for drawings.*

(a) *Paper and ink.* Drawings must be made upon ►paper which is flexible, strong, white, smooth, non-shiny and durable.◄ [pure white paper of a thickness corresponding to] Two-ply or three-ply bristol-board ►is preferred◄. The surface of the paper ►should◄ [must] be calendered [and smooth] and of a quality which will permit erasure and correction with India ink. India ink, or its equivalent in quality, ►is preferred◄ [must be used] for pen drawings to secure perfectly black solid lines. The use of white pigment to cover lines is not ►normally◄ acceptable.

(b) *Size of sheet and margins.* The size of ►the sheets on which drawings are made may either be◄ [a sheet on which a drawing is made must be] exactly 8½ by 14 inches (21.6 by 35.6 cm.) ►or exactly 21.0 by 29.7 cm. (DIN size A4). All drawing sheets in a particular application must be the same size.◄ One of the shorter sides of the sheet is regarded as its top.

►(1) On 8½ by 14 inch drawing sheets,◄ the drawing must include a top margin of 2 inches (5.1 cm.) and bottom and side margins of one-quarter inch (6.4 mm.) from the edges, thereby leaving a "sight" precisely 8 by 11¾ inches (20.3 by 29.8 cm.). Margin border lines are not permitted. All work must be included within the "sight." The sheets may be provided with two one-quarter inch (6.4 mm.) diameter holes having their centerlines spaced eleven-sixteenths inch (17.5 mm.) below the top edge and 2¾ inches (7.0 cm.) apart, said holes being equally spaced from the respective side edges.

►(2) On 21.0 by 29.7 cm. drawing sheets, the drawing must include a top margin of at least 2.5 cm., a left side margin of 2.5 cm., a right side margin of 1.5 cm., and a bottom margin of 1.0 cm. Margin border lines are not permitted. All work must be contained within a sight size not to exceed 17 by 26.2 cm.◄

(c) *Character of lines.* All drawings must be made with drafting instruments or by a process which will give them satisfactory reproduction characteristics. Every line and letter must be ►durable, black or blue, sufficiently dense and dark, uniformly thick and well defined;◄ [absolutely black and permanent;] the weight of all lines and letters must be heavy enough to permit adequate reproduction. This direction applies to all lines however fine, to shading, and to lines representing cut surfaces in sectional views. All lines must be clean, sharp, and solid [, and fine] ►. Fine◄ or crowded lines should be avoided. Solid black ►or blue◄ should not be used for sectional or surface shading. Freehand work should be avoided wherever it is possible to do so.

(d) *Hatching and shading.* (1) Hatching should be made by oblique parallel lines ►spaced sufficiently apart to enable the lines to be distinguished without difficulty◄ [, which may be not less than about one-twentieth inch (1.3 mm.) apart].

(2) Heavy lines on the shade side of objects should ►preferably◄ be used except where they tend to thicken the work and obscure reference characters. The light should come from the upper left hand corner at an angle of 45°. Surface delineations should ►preferably◄ be shown by proper shading, which should be open.

(e) *Scale.* The scale to which a drawing is made ought to be large enough to show the mechanism without crowding when the drawing is reduced ►in size to two-thirds◄ in reproduction, and views of portions of the mechanism on a larger scale should be used when necessary to show details clearly; two or more sheets should be used if one does not give sufficient room to accomplish this end, but the number of sheets should not be more than is necessary.

(f) *Reference characters.* The different views should be consecutively numbered figures. Reference numerals (and letters, but numerals are preferred) must be plain, legible and carefully formed, and not be encircled. They should, if possible, measure at least one-eighth of an inch (3.2 mm.) in height so that they may bear reduction to one twenty-fourth of an inch (1.1 mm.); and they may be slightly larger when there is sufficient room. They ►should◄ [must] not be so placed in the close and complex parts of the drawing as to interfere with a thorough comprehension of the same, and therefore should rarely cross or mingle with the lines. When necessarily grouped around a certain part, they should be placed at a little distance, at the closest point where there is available space, and connected by lines which the parts to which they refer. They should not be placed upon hatched or shaded surfaces but when necessary, a blank space may be left in the hatching or shading where the character occurs so that it shall appear perfectly distinct and separate from the work. The same part of an invention appearing in more than one view of the drawing must always be designated by the same character, and the same character must never be used to designate different parts. ►Reference signs not mentioned in the description shall not appear in the drawing, and vice versa.◄

* * * * *

(i) *Views.* The drawing must contain as many figures as may be necessary to show the invention; the figures should

be consecutively numbered if possible in the order in which they appear. The figures may be plain, elevation, section, or perspective views, and detail views of portions or elements, on a larger scale if necessary, may also be used. Exploded views, with the separated parts of the same figure embraced by a bracket, to show the relationship or order of assembly of various parts are permissible. When necessary, a view of a large machine or device in its entirety may be broken and extended over several sheets if there is no loss in facility of understanding the view. ►Where figures on two or more sheets form in effect a single complete figure, the figures on the several sheets should be so arranged that the complete figure can be assembled without concealing any part of any of the figures appearing in the various sheets◄ [(the different parts should be identified by the same figure number but followed by the letters, a, b, c, etc., for each part)]. The plane upon which a sectional view is taken should be indicated on the general view by a broken line, the ends of which should be designated by numerals corresponding to the figure number of the sectional view and have arrows applied to indicate the direction in which the view is taken. A moved position may be shown by a broken line superimposed upon a suitable figure if this can be done without crowding, otherwise a separate figure must be used for this purpose. Modified forms of construction can only be shown in separate figures. Views should not be connected by projection lines nor should center lines be used.

(j) *Arrangement of views.* All views on the same sheet ►should◄ [must] stand in the same direction and [should], if possible, stand so that they can be read with the sheet held in an upright position. If views longer than the width of the sheet are necessary for the clearest illustration of the invention, the sheet may be turned on its side so that the ►top of the sheet with the appropriate top margin◄ [two-inch (5.1 cm.) margin] is on the right hand side. One figure must not be placed upon another or within the outline of another.

* * * * *

(1) *Extraneous matter.* [An inventor's, agent's, or attorney's name, signature, stamp, or address, or other extraneous matter, will not be permitted upon the face of a drawing, within or without the margin, except that] Indentifying indicia (►such as the◄ attorney's docket number, inventor's name, number of sheets, etc.) [should] ►not to exceed 2¾ inches (7.0 cm.) in width may◄ be placed ►in a centered location between the side edges◄ within three-fourths inch (19.1 mm.) of the top edge [and between the hole locations defined in paragraph (b) of this section]. Authorized security markings may be placed on the drawings provided they [be] ►are◄ outside the illustrations and are removed when the material is declassified. ►Other extraneous matter will not be permitted upon the face of a drawing.◄

* * * * *

25. By adding new paragraphs (c) and (d) to § 1.104 to read as follows:

§ 1.104 *Nature of examination; examiner's action.*

* * * * *

►(c) An international-type search will be made in all national applications filed on and after the date the United States Patent and Trademark Office is appointed as an International Searching Authority.◄

►(d) Any national application may also have an international-type search report prepared thereon at the time of the national examination upon specific written request therefor and payment of the international-type search report fee. See § 1.21(w) for amount of fee for preparation of international-type search report.◄

26. By revising § 1.141 to read as follows:

§ 1.141 *Different inventions in one application.*

►(a)◄ Two or more independent and distinct inventions may not be claimed in one application ►. However, a group of inventions which are so linked as to form a single general inventive concept such as those set forth in paragraphs (b), (c) or (d) of this section, are considered to be one invention under §§ 1.141–1.146◄ [except that more than one species of an invention, not to exceed five].

►(b) Different species of an invention◄ may be specifically claimed in different claims in one application, provided the application also includes an allowable claim generic to all the claimed species and all the claims to [each] species in excess of one are written in dependent form (§ 1.75) or otherwise include all the limitations of the generic claim.

►(c) Paragraph (a) of this section shall be construed as permitting the examination of claims of different categories in an application, in particular either of the following two groupings of claims of different categories:◄

►(i) in addition to an independent claim for a given product, the inclusion in the same application of one independent claim for one process specially adapted for the manufacture of the said product, or the inclusion in the same application of one independent claim for one use of the said product, or both; or◄

►(ii) in addition to an independent claim for a given process, the inclusion in the same application of one independent claim for one apparatus or means specifically designed for carrying out the said process.◄

►(d) If the product claim of subparagraph (i) of paragraph (c) of this section or the process claim of subparagraph (ii) of paragraph (c) of this section is not allowable, the examiner may withdraw from consideration the claims to the other categories. If subsequently such a product or process claim is found allowable, the examiner must also consider the merits of the claims to the other categories as indicated in subparagraphs (i) and (ii) of paragraph (c) of this section.◄

►(e) Subject to paragraph (a) of this section, and except where paragraph (c) of this section applies, there may be included in the same application two or more independent claims of one and the same category (i.e., product, process, apparatus, or use) which cannot readily be covered by a single generic claim.◄

27. By revising § 1.146 to read as follows:

§ 1.146 *Election of species.*

In the first action on an application containing a generic claim and claims restricted separately to each of more than one species embraced thereby, the examiner[, if of the opinion after a complete search on the generic claims that no generic claim presented is allowable,] shall require the applicant in his response to that action to elect that species of his invention to which his claims shall be restricted if no generic claim is finally held allowable. [However, if such application contains claims directed to more than five species, the examiner may require restriction of the claims to not more than five species before taking any further action in the case.]

28. By adding a new § 1.318 to read as follows:

►§ 1.318 *Notification of national publication of a patent based on an international application.*◄

►The Office will notify the International Bureau when a patent is issued on an application filed under 35 U.S.C. 371, and there has been no previous international publication.◄

29. By revising paragraphs (a) and (c) of § 1.331 to read as follows:

§ 1.331 *Recording of assignments.*

(a) Assignments, including grants and conveyances, of patents ►, national applications, or international applications which designate the United States of America◄ [or applications for patents] under 35 U.S.C. 261, will be recorded in the Patent and Trademark Office. Other instruments affecting title to a patent [or application for patent,] ►, a national application, or an international application which designates the United States of America◄, and licenses, even though the recording thereof may not serve as constructive notice under 35 U.S.C. 261, will be recorded as provided in this section or in the discretion of the Commissioner.

* * * * *

(c) An instrument relating to a patent should identify the patent by number and date (the name of the inventor and title of the invention as stated in the patent should also be given); an instrument relating to [an] ►a national application, or an international◄ application ►which designates the United States of America◄ should identify the application by serial ►number or international application◄ number and date of filing (the name of the inventor and title of the in-

vention as stated in the application should also be given) but if an assignment is executed concurrently with or subsequent to the execution of the application but before the application is filed or before its serial ►number or international application◄ number and filing date are ascertained, it should adequately identify the application, as by its date of execution and name of the inventor and title of the invention; so that there can be no mistake as to the patent or application intended.

Proposed Subpart C

30. By adding a new § 1.401 to read as follows:

►§ 1.401 *Definitions of Terms under the Patent Cooperation Treaty.*◄

►(a) The abbreviation "PCT" or the term "Treaty" means the Patent Cooperation Treaty.◄

►(b) "International Bureau" means the World Intellectual Property Organization located at 32 chemin des Colombettes, Geneva, Switzerland.◄

►(c) "Administrative Instructions" means that body of instructions for operating under the Patent Cooperation Treaty referred to in PCT Rule 89.◄

►(d) "Request," when capitalized, means that element of the international application described in PCT Rules 3 and 4.◄

►(e) "International application," as used in this Subchapter is defined in § 1.9.◄

►(f) "Priority date" for the purposes of computing time limits under the Patent Cooperation Treaty is defined in PCT Art. 2 (xi). Note also § 1.465.◄

►(g) Other terms and expressions in this subpart C not defined in this section are to be taken in the sense indicated in PCT Art. 2 and 35 U.S.C. 351.◄

31. By adding a new § 1.412 to reads as follows:

◄§ 1.412 *The United States Receiving Office.*◄

►(a) The United States Patent and Trademark Office is a Receiving Office only for applicants who are residents or nationals of the United States of America.◄

►(b) The Patent and Trademark Office, when acting as a Receiving Office, will be identified by the full title "United States Receiving Office" or by the abbreviation "RO/US."◄

►(c) The major functions of the Receiving Office include:

(1) according of international filing dates to international applications meeting the requirements of PCT Art. 11(1), and PCT Rule 20;

(2) assuring that international applications meet the standards for format and content of PCT Art. 14(1), PCT Rules 9, 26, 29.1, 37, 38, 91, and portions of PCT Rules 3 through 11;

(3) collecting and, when required, transmitting fees due for processing international applications (PCT Rules 14, 15, 16); and

(4) transmitting the record and search copies to the International Bureau and International Searching Authority, respectively (PCT Rules 22 and 23).◄

32. By adding a new § 1.413 to read as follows:

►§ 1.413 *The International Searching Authority of Washington.*◄

►(a) Pursuant to appointment by the Assembly, the United States Patent and Trademark Office will act as an International Searching Authority for international applications filed with the United States Receiving Office, in accordance with agreement between the Patent and Trademark Office and the International Bureau (PCT Art. 16(3)(b)).◄

►(b) The Patent and Trademark Office, when acting as an International Searching Authority, will be identified by the full title "International Searching Authority of Washington," or by the abbreviation "ISA/US."◄

►(c) The major functions of the International Searching Authority include:

(1) approving or establishing the title and abstract;

(2) considering the matter of unity of invention;

(3) conducting international and international-type searches and preparing international and international-type search reports (PCT Art. 15, 17 and 18, and PCT Rules 25, 33–45 and 47); and

(4) transmitting the international search report to the applicant and the International Bureau.◄

33. By adding a new § 1.414 to read as follows:

►§ 1.414 *The United States Designated Office.*◄

►(a) The United States Patent and Trademark Office will act as a Designated Office for international applications in which the United States of America has been designated as a State in which patent protection is desired.◄

►(b) The Patent and Trademark Office, when acting as a Designated Office during international processing will be identified by the full title "United States Designated Office" or by the abbreviation "DO/US."◄

►(c) The major functions of the United States Designated Office in respect to international applications in which the United States of America has been designated, include:

(1) receiving various notifications throughout the international stage,

(2) accepting for regular national patentability examination international applications which satisfy the requirements of 35 U.S.C. 371, and

(3) conducting reviews under PCT Article 25 for those international applications declared withdrawn.◄

34. By adding a new § 1.415 to read as follows:

►§ 1.415 *The International Bureau.*◄

►(a) The International Bureau is the World Intellectual Property Organization located at Geneva, Switzerland. It is the international intergovernmental organization which acts as the coordinating body under the Treaty and the Regulations. (PCT Art. 2 (xix) and 35 U.S.C. 351(h).)◄

►(b) The major functions of the International Bureau include:

(1) publishing of international applications and the International Gazette;

(2) transmitting copies of international applications to Designated Offices;

(3) storing and maintaining record copies; and transmitting information to authorities pertinent to the processing of specific international applications.◄

35. By adding a new § 1.421 to read as follows:

►§ 1.421 *Applicant for international application.*◄

►(a) Only residents or nationals of the United States of America may file international applications in the United States Receiving Office.◄

►(b) Although the United States Receiving Office will accept international applications filed by any resident or national of the United States of America for international processing, an international application designating the United States of America will be accepted by the Patent and Trademark Office for the national stage only if filed by the inventor or as provided in §§ 1.422, 1.423 or 1.425.◄

►(c) International applications which do not designate the United States of America may be filed by the assignee or owner.◄

►(d) Any indication of different applicants for the purpose of different designated offices must be shown on the Request portion of the international application.◄

►(e) Changes in the person, name, or address of the applicant shall be made in accordance with PCT Rule 18.5.◄

36. By adding a new § 1.422 to read as follows:

►§ 1.422 *When the inventor is dead.*◄

►In case of the death of the inventor, the legal representative (executor, administrator, etc.) of the deceased inventor may sign the Request and other papers in an international application which designates the United States of America.◄

37. By adding a new § 1.423 to read as follows.

►§ 1.423 *When the inventor is insane or legally incapacitated.*◄

►In case an inventor is insane or otherwise legally incapacitated, the legal representative (guardian, conservator, etc.) of such inventor may sign the Request and other papers in an international application which designates the United States of America.◄

38. By adding a new § 1.424 to read as follows:

►§ 1.424 *Joint inventors.*◄

►Joint inventors must each sign the Request in an international application which designates the United States of

America; the signature of either of them alone, or less than the entire number will be insufficient for an invention invented by them jointly, except as provided in § 1.425.◄

39. By adding a new § 1.425 to read as follows:

►§ 1.425 *Filing by other than inventor.*◄

►(a) If a joint inventor refuses to join in an international application which designates the United States of America or cannot be found or reached after diligent effort, the international application which designates the United States of America may be filed by the other inventor on behalf of himself and the omitted inventor. Such an international application which designates the United States of America must be accompanied by proof of the pertinent facts and must state the last known address of the omitted inventor. The Patent and Trademark Office shall forward notice of the filing of the international application to the omitted inventor at said address.◄

►(b) Whenever an inventor refuses to execute an international application which designates the United States of America, or cannot be found or reached after diligent effort, a person to whom the inventor has assigned or agreed in writing to assign the invention or who otherwise shows sufficient proprietary interest in the matter justifying such action may file the international application on behalf of and as agent for the inventor. Such an international application which designates the United States of America, must be accompanied by proof of the pertinent facts and a showing that such action is necessary to preserve the rights of the parties or to prevent irreparable damage, and must state the last known address of the inventor. The assignment, written agreement to assign or other evidence of proprietary interest, or a verified copy thereof, must be filed in the Patent and Trademark Office. The Office shall forward notice of the filing of the application to the inventor at the address stated in the application.◄

40. By adding a new § 1.431 to read as follows:

►§ 1.431 *International application requirements.*◄

►(a) An international application shall contain, as specified in the Treaty and the Regulations, a Request, a description, one or more claims, one or more drawings (where required), and an abstract (PCT Art. 3(2)).◄

►(b) An international filing date will be accorded by the United States Receiving Office, at the time of receipt of the international application, provided that:

(1) The applicant is a United States resident or national (35 U.S.C. 361(a), PCT Art. 11(1)(i)).

(2) The international application is in the English language (35 U.S.C. 361(c), PCT Art. 11(1)(ii)).

(3) The international application contains at least the following elements (PCT Art. 11(1)(iii)):

(i) an indication that it is intended as an international application (PCT Rule 4.2),

(ii) the designation of at least one contracting State of the International Patent Cooperation Union,

(iii) the name of the applicant, as prescribed (note § 1.422),

(iv) a part which on the face of it appears to be a description, and

(v) a part which on the face of it appears to be a claim (PCT Art. 11(1)).◄

►(c) Payment of the basic portion of the international fee (PCT Rule 15.2) and the transmittal and search fee (§ 1.441) shall be made in full at the time the international application papers required by paragraph (b) of this section are deposited. Failure to make full payment on the same date as the deposit of the international application papers required by subparagraph (b) of this section will result in the international application being considered withdrawn (PCT Art. 14(3)(a)).◄

41. By adding a new § 1.432 to read as follows:

►§ 1.432 *Designation of States and payment of designation fees.*◄

►(a) The names of Designated States shall appear in the Request upon filing and must be indicated as set forth in Section 202 of the Administrative Instructions.◄

►(b) The designation fees may be paid upon filing of the international application, but must be paid at the latest before the expiration of one year from the priority date (PCT Rule 15.4(b)). Failure to timely pay the designation fee for a particular Designated State will result in the withdrawal of that designation (PCT Art. 14(3)(b)). Failure to timely pay at least one designation fee will result in the withdrawal of the international application (PCT Art. 14(3)(a)).◄

42. By adding a new § 1.433 to read as follows:

►§ 1.433 *Physical requirements of international application.*◄

►(a) The international application and each of the documents that may be referred to in the check list of the Request (PCT Rule 3.3(a)(ii)) shall be filed in one copy only.◄

►(b) The physical requirements for international applications are set forth in PCT Rule 11 and Sections 201–208 of the Administrative Instructions.◄

43. By adding a new § 1.434 to read as follows:

►§ 1.434 *The Request.*◄

►(a) The Request shall be made on a standardized printed form (PCT Rules 3 and 4). Copies of such printed Request forms are available from the Patent and Trademark Office.◄ Letters requesting such forms should be marked "Box PCT."

►(b) The Check List portion of the Request form should indicate each document accompanying the international application on filing.◄

►(c) All information, for example, addresses, names of States and dates, shall be indicated in the Request as required by PCT Rule 4 and Administrative Instructions 201 and 202.◄

►(d) International applications which designate the United States of America shall include:

(1) the name, address, and signature of the inventor, except as provided by §§ 1.422, 1.423 and 1.425;

(2) a reference to any copending national application or international application designating the United States of America, if the benefit of the filing date of the prior copending application is to be claimed.◄

44. By adding a new § 1.435 to read as follows:

►§ 1.435. *The Description.*◄

►(a) Requirements as to the content and form of the description are set forth in PCT Rules 5, 9, 10, and 11 and Administrative Instruction 205, and shall be adhered to.◄

►(b) In International applications designating the United States of America the description must contain upon filing an indication of the best mode contemplated by the inventor for carrying out the claimed invention.◄

45. By adding a new § 1.436 to read as follows:

►§ 1.436 *The Claims.*◄

►The requirements as to the content and format of claims are set forth in PCT Art. 6 and PCT Rules 6, 9, 10, and 11 and shall be adhered to.◄

46. By adding a new § 1.437 to read as follows:

►§ 1.437 *The Drawings.*◄

►(a) Subject to paragraph (b) of this section, when drawings are necessary for the understanding of the invention, or are mentioned in the description, they must be part of an international application as originally filed in the United States Receiving Office in order to maintain the international filing date during the national stage (PCT Art. 7).◄

►(b) Drawings missing from the application upon filing will be accepted if such drawings are received within 30 days of the date of first receipt of the incomplete papers. If the missing drawings are received within the 30 day period, the international filing date shall be the date on which such drawings are received. If such drawings are not timely received all references to drawings in the international application shall be considered non-existent (PCT Art. 14(2), Administrative Instruction 310).◄

►(c) The physical requirements for drawings are set forth in PCT Rule 11 and shall be adhered to.◄

47. By adding a new § 1.438 to read as follows:

►§ 1.438 *The Abstract.*◄

►(a) Requirements as to the content and form of the abstract are set forth in PCT Rule 8, and shall be adhered to.◄

►(b) Lack of an abstract upon filing of an international application will not affect the granting of a filing date. However, failure to furnish an abstract within one month from the date of the notification by the Receiving Office will result in the international application being declared withdrawn.◄

48. By adding a new § 1.445 to read as follows:

►§ 1.445 *International application filing and processing fees.*◄

►(a) The following fees and charges are established by the Patent and Trademark Office under the authority of 35 U.S.C. 376:

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14)—$35.00.

(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16)—$300.00.

(3) A supplemental search fee when required (see PCT Art. 17(3)(a) and PCT Rule 40.2)—$200.00 per additional invention.

(4) The national fee, that is, the amount set forth as the filing fee under 35 U.S.C. 41(a)1.

(5) A special fee when required, see 35 U.S.C. 372(c)—$10.00 per claim.◄

►(b) The basic fee and designation fee portions of the international fee shall be as prescribed in PCT Rule 15.◄

49. By adding a new § 1.446 to read as follows:

►§ 1.446 *Refund of international application filing and processing fees.*◄

►(a) Money paid for international application fees, where paid by actual mistake or in excess, such as a payment not required by law or Treaty and its Regulations, will be refunded.◄

►(b) Refunds of a portion of the search fee may be made if the international search report is wholly or partly based on an earlier international or international-type search. (PCT Rules 16 and 41.) The amount of the refund will be as determined by the examiner according to the value of the prior international-type search or international search as 90%, 70%, 40%, 25% or 0% of the international search fee. See § 1.26 for refund of a portion of the international search fee during subsequent national examination of the application.◄

►(c) Refund of the supplemental search fees will be made if such refund is determined to be warranted by the Commissioner or his designee acting under PCT Rule 40.2(c).◄

►(d) The international and search fees will be refunded if no international filing date is granted (PCT Rules 15.6 and 16.2).◄

50. By adding a new § 1.451 to read as follows:

►§ 1.451 *The priority claim and priority document in an international application.*◄

►(a) The claim for priority must be made on the Request (PCT Rule 4.10) in a manner complying with Section 201 and 202 of the Administrative Instructions.◄

►(b) Whenever the priority of an earlier United States national application is claimed in an international application, the applicant may request in a letter of transmittal accompanying the international application upon filing with the United States Receiving Office, that the Patent and Trademark Office prepare a certified copy of the national application for transmittal with the record copy to the International Bureau (PCT Art. 8 and PCT Rule 17). The fee for preparing a certified copy is stated in § 1.21(b) and (d).◄

►(c) If a certified copy of the priority document is not submitted together with the international application on filing or a request and appropriate payment as in paragraph (b) of this section do not accompany the international application on filing, the certified copy of the priority document must be transmitted directly by the applicant to the International Bureau within the time limit specified in PCT Rule 17.1(a).◄

51. By adding a new § 1.455 to read as follows:

►§ 1.455 *Representation in international applications.*◄

►(a) Applicants of international applications may be represented by attorneys or agents licensed to practice before the Patent and Trademark Office or by a common representative (PCT Art. 49, Rules 4.8 and 90 and § 1.341).◄

►(b) Appointment of an agent, attorney or common representative must be effected either in the Request form, signed by all applicants, or in a separate power of attorney submitted either to the United States Receiving Office or to the International Bureau.◄

►(c) Powers of attorney and revocations thereof should be submitted to the United States Receiving Office until the issuance of the international search report in order to facilitate communications.◄

►(d) The addressee for correspondence will be as indicated in Section 108 of the Administrative Instructions.◄

52. By adding a new § 1.461 to read as follows:

►§ 1.461 *Procedures for transmittal of Record Copy to the national Bureau.*◄

►(a) Transmittal of the record copy of the international application to the International Bureau shall be made, at the option of the applicant, either by the United States Receiving Office or by the applicant. Subject to paragraph (b) of this section, any applicant who chooses to make such transmittal himself shall notify the United States Receiving Office to that effect in writing, by way of a notice filed together with the international application. Such notice shall also state whether the applicant wishes to collect the record copy at the United States Receiving Office or to have the record copy mailed directly to him. The record copy of an international application which was filed without being accompanied by such notice will be transmitted to the International Bureau by the United States Receiving Office. (PCT Rule 22).◄

►(b) An applicant may transmit the record copy to the International Bureau as provided in PCT Rule 22.2 only if the international application is filed with the United States Receiving Office before the expiration of 11 months from the priority date.◄

53. By adding a new § 1.465 to read as follows:

►§ 1.465 *Timing of application processing based on the priority date.*◄

►(a) For the purpose of computing time limits under the Treaty, the priority date shall be defined as in PCT Art. 2(xi).◄

►(b) When a claimed priority date is cancelled under PCT Rule 4.10(d) or considered not to have been made under PCT Rule 4.10(a), the priority date for the purposes of computing time limits will be the date of the earliest valid remaining priority claim of the international application, or if none, the international filing date.◄

►(c) When corrections under PCT Art. 11(2), Art. 14(2) or Rule 20.2(a)(i) or (iii) are timely submitted, and the date of receipt of such corrections falls later than one year from the claimed priority date or dates, the Receiving Office shall proceed under Rule 4.10(d).◄

54. By adding a new § 1.468 to read as follows:

►§ 1.468 *Delays in meeting time limits.*◄

►(a) Delays in meeting time limits during international processing of international applications may only be excused as provided in PCT Rule 82. For delays in meeting time limits in a national application see § 1.137.◄

►(b) In cases of unavoidable delay or loss in the mail during international processing of international applications, evidence may be offered only if the mail that was delayed or lost was registered by the postal authorities.◄

55. By adding a new § 1.471 to read as follows:

►§ 1.471 *Corrections and amendments during international processing.*◄

►(a) All corrections submitted to the United States Receiving Office must be in the form of replacement sheets and be accompanied by a letter that draws attention to the differences between the replaced sheets and the replacement sheets, except that the deletion of lines of text, the correction of simple typographical errors, and one addition or change of not more than five words per sheet may be stated in a letter and the United States Receiving Office will make the deletion or transfer the correction to the international application,

provided that such corrections do not adversely affect the clarity and direct reproducibility of the application (PCT Rule 26.4).◄

►(b) Amendments of claims submitted to the International Bureau shall be as prescribed by PCT Rule 46.◄

56. By adding a new § 1.475 to read as follows.

►§ 1.475 *Changes in person, name, or address of applicants and inventors.*◄

►All requests for a change in person, name or address of applicants and inventors should be sent to the United States Receiving Office until the time of issuance of the international search report. Thereafter requests for such changes should be submitted to the International Bureau.◄

57. By adding § 1.481 to read as follows:

►§ 1.481 *Determination of Unity of Invention before the International Searching Authority.*◄

►(a) Before establishing the international search report, the International Searching Authority shall determine whether the international application complies with the requirement of unity of invention as set forth in PCT Rule 13. If the International Searching Authority considers that the international application does not so comply, it shall inform the applicant accordingly and request the payment of additional fees. (Note § 1.441 and PCT Art. 17(3)(a) and PCT Rule 40.)◄

►(b) The applicant will be given a time period in accordance with PCT Rule 40.3 to pay the additional fees due.◄

►(c) If the applicant disagrees with the holding of lack of unity of invention by the International Searching Authority, he may pay the additional fee under protest, that is accompanied by a request for refund and a statement setting forth his reasons for disagreement or why he considers the required additional fees excessive, or both (PCT Rule 40.2(c).◄

►(d) Protests under paragraph (c) of this section will be examined by the Commissioner or his designee. In the event that the applicant's protest is determined to be justified, the additional fees or a portion thereof will be refunded.◄

►(e) An applicant who desires that a copy of the protest and the decision thereon accompany the international search report when forwarded to the designated offices, may notify the International Searching Authority to that effect any time prior to the issuance of the international search report. Thereafter, such notifications should be directed to the International Bureau. (PCT Rule 40.2(c).)◄

►(f) The international search report will be established only on those parts of the international application which relate to the invention first mentioned in the claims ("main invention") and those other parts of the international applications which relates to inventions for which additional fees have been timely paid (PCT Art. 17(3)(a) and PCT Rule 40.3).◄

58. By adding § 1.482 to read as follows:

►§ 1.482 *Holding of lack of unity of invention.*◄

►(a) The International Search Authority may not raise the objection of lack of unity of invention merely because an application contains several claims of the same category or several claims of different categories related as under PCT Rules 13.2 and 13.3.◄

►(b) Lack of unity of invention may exist in a single claim where the claim contains alternatives which are not linked by a single general inventive concept (PCT Rule 13.1).◄

►(c) Lack of unity of invention may be directly evident before considering the claims in relation to any prior art, or after taking the prior art into consideration, as where a document discovered during the search shows the invention claimed in a generic or linking claim lacks novelty or is clearly obvious, leaving two or more claims joined thereby without a common inventive concept. In such a case the International Searching Authority may raise the objection of lack of unity of invention (and limit the search to the invention first mentioned if no additional fees are paid).◄

►(d) Occasionally in cases which lack unity of invention, the examiner will be able to make a complete search for all inventions with negligible additional work, in particular when the inventions are conceptually very close and none of them requires a search in separate classification units. In those cases, the search for the additional inventions should be completed together with that for the invention first mentioned. All results should then be included in a single search report, and no objection of lack of unity should ordinarily be raised.◄

►(e) For unity of invention practice at the national stage see §§ 1.141–1.146.◄

59. By adding a new § 3.56 to read as follows:

►§ 3.56 *Oath to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).*◄

►As a below-named inventor, being duly sworn (or affirmed), I depose and say that:

My residence, post office address and citizenship are as stated below next to my name;

I verily believe I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the invention entitled: _____

described and claimed in international application number _____ filed _____, and as amended on _____ (if any), for which I solicit a patent;

I do not know and do not believe the same was ever known or used in the United States of America before my or our invention thereof, or patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to my international application, that the same was not in public use or on sale in the United States of America more than one year prior to my international application, that the invention has not been patented or made the subject of an inventor's certificate issued before the date of my international application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to my international application, and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by me or my legal representatives or assigns except as follows: _____

_____

_____

(Full name of sole or first inventor)

_____ Date _____

(Inventor's signature)

_____

(Residence)

_____

(Citizenship)

_____

(Post Office Address)

_____

_____

(Full name of second joint inventor, if any)

_____ Date _____

(Inventor's signature)

_____

(Residence)

_____

(Citizenship)

_____

(Post Office Address)

_____

(Supply similar information and signature for third and subsequent joint inventors)

_____ } ss:
_____ }

Sworn to and subscribed before me this _____ day of _____, 19__.

_____

(Signature of notary or officer)

[SEAL]

_____

(Official character) ◄

60. By adding a new § 3.57 to read as follows:

►§ 3.57 *Declaration to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).*◄

►As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I verily believe I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the invention entitled: _____

described and claimed in international application number _____ filed _____ and as amended on _____ (if any), for which I solicit a patent;

I do not know and do not believe the same was ever known or used in the United States of America before my or our invention thereof, or patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to my international application, that the same was not in public use or on sale in the United States of America more than one year prior to my international application, that the invention has not been patented or made the subject of any inventor's certificate issued before the date of my international application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to my international application, and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by me or my legal representatives or assigns, except as follows:

_____

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

_____
(Full name of sole or first inventor)

_____ Date _____
(Inventor's signature)

_____
(Residence)

_____
(Citizenship)

_____
(Post Office Address)

_____

_____
(Full name of second joint Inventor, if any)

_____ Date _____
(Inventor's signature)

_____
(Residence)

_____
(Citizenship)

_____
(Post Office Address)

◄

_____

61. By revising § 5.1 to read as follows:

§ 5.1 *Defense inspection of certain applications.*

►(a) The provisions of this part shall apply to both national and international applications filed in the Patent and Trademark Office except as otherwise specifically indicated. The filing of an international application designating a foreign country is considered to be a filing in a foreign country within the meaning of Chapter 17 of Title 35, United States Code.◄

►(b)◄ In accordance with the provisions of 35 U.S.C. 181, patent applications containing subject matter the disclosure of which might be detrimental to the national security are made available for inspection by defense agencies as specified in said section. Only applications obviously relating to national security, and applications within fields indicated to the Patent and Trademark Office by the defense agencies as so related, are made available. The inspection will be made only by responsible representatives authorized by the agency to review applications. Such representatives are required to sign a dated acknowledgement of access accepting the condition that information obtained from the inspection will be used for no purpose other than the administration of 35 U.S.C. 181–188. Copies of applications may be made available to such representatives for inspection outside the Patent and Trademark Office under conditions assuring that the confidentiality of the applications will be maintained, including the conditions that: (a) All copies will be returned to the Patent and Trademark Office promptly if no secrecy order is imposed, or upon rescission of such order if one is imposed, and (b) no additional copies will be made by the defense agencies. A record of the removal and return of copies made available for defense inspection will be maintained by the Patent and Trademark Office. Applications relating to atomic energy are made available to the [Atomic Energy Commission] ►Energy Research and Development Administration◄ as specified in § 1.14 of this chapter.

62. By revising § 5.3 to read as follows:

§ 5.3 *Prosecution of application under secrecy order; withholding patent.*

Unless specifically ordered otherwise, action on the application by the Office and prosecution by the applicant will proceed during the time an application is under secrecy order to the point indicated in this section:

(a) ►National◄ applications under secrecy order which come to a final rejection must be appealed or otherwise prosecuted to avoid abandonment. Appeals in such cases must be completed by the applicant but unless otherwise specifically ordered by the Commissioner will not be set for hearing until the secrecy order is removed.

(b) An interference will not be declared involving ►national◄ applications under secrecy order. However, if an application under secrecy order copies claims from an issued patent, a notice of that fact will be placed in the file wrapper of the patent.

(c) When the ►national◄ application is found to be in condition for allowance except for the secrecy order the applicant and the agency which caused the secrecy order to be issued will be notified. This notice (which is not a notice of allowance under § 1.311 of this chapter) does not require response by the applicant and places the ►national◄ application in a condition of suspension until the secrecy order is removed. When the secrecy order is removed the Patent and Trademark Office will issue a notice of allowance under § 1.311 of this chapter, or take such other action as may then be warranted.

►(d) International applications under secrecy order will be processed up to the point where the record and search copies are ready to be forwarded. However, the copies will not be forwarded to the Authorities or delivered to the applicant.◄

63. Section 5.11 is revised to read as follows:

§ 5.11 *License for filing application in foreign country ►or for filing international application.◄*

(a) When no secrecy order has been issued under § 5.2, a license from the Commissioner of Patents and Trademarks under 35 U.S.C. 184 is required before filing any application for patent or for the registration of a utility model, industrial design, or model, in a foreign country, ►or filing an international application,◄ or causing or authorizing such filing, with respect to an invention made in the United States, if:

(1) The foreign application ►or international application◄ is to be filed ►,◄ or its filing caused or authorized ►,◄ before [an] ►a national◄ application for patent is filed in the United States, or

(2) The foreign application ►or international application◄ is to be filed, or its filing caused or authorized, prior to the expiration of six months from the filing of the ►national◄ application in the United States.

(b) When there is no secrecy order in effect, a license under 35 U.S.C. 184 is not required if;

(1) The invention was not made in the United States, or

(2) The foreign application ►or international application◄ is to be filed, or its filing caused or authorized, after the expiration of six months from the filing of the ►national◄ application in the United States.

(c) When a secrecy order has been issued under § 5.2, an application cannot be filed in a foreign country ►, nor can an international application be filed,◄ in any case except in accordance with § 5.5.

64. By revising paragraphs (b) and (c) of § 5.14 to read as follows:

§ 5.14 *Petition for license; corresponding U.S. application.*

* * * * *

(b) Two or more United States applications should not be referred to in the same petition for license unless they are to be combined in the foreign ►or international◄ application, in which event the petition should so state and the identification of each United States application should be in separate paragraphs.

(c) Where the application to be filed abroad ►or the international application◄ contains matter not discussed in the United States application or applications, including the case where the combining of two or more United States applications introduces subject matter not disclosed in any of them, a copy of the application as it is to be filed in the foreign country ►or international application as it is to be filed in the Receiving Office◄ must be furnished with the petition. If, however, all new matter in the ►foreign or international◄ application to be filed is readily identifiable, the new matter may be submitted in detail and the remainder by reference to the pertinent United States application or applications.

65. By revising § 5.15 to read as follows:

§ 5.15 *Scope of license.*

(a) A license to file an application in a foreign country ►or to file an international application◄, when granted, includes authority to forward all duplicate and formal papers to the foreign country ►or international authorities◄ and to make amendments and take any action in the prosecution of the ►foreign or international◄ application, provided subject matter additional to that covered by the license is not involved. In those cases in which no license is required to file the foreign ►or international◄ application, no license is required to file papers in connection with the prosecution of the foreign ►or international◄ application not involving disclosure of additional subject matter. Any paper filed abroad ►or before an international authority◄ following the filing of a foreign ►or international◄ application which involves the disclosure of additional subject matter must be separately licensed in the same manner as ►a foreign or international◄ [an] application.

* * * * *

66. By revising § 5.17 to read as follows:

§ 5.17 *Who may use license.*

Licenses may be used by anyone interested in the foreign ►or international◄ filing for or on behalf of the inventor or his assigns.

Date: December 23, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved:

BETSY ANCKER-JOHNSON, PH.D.
Assistant Secretary for Science and Technology.

Date. Jan. 6, 1977.

[FR Doc. 77-1024; Filed 1-11-77; 8.45 am]

Published 42 FR No. 8, 2632-2644, Jan. 12, 1977.

[955 O.G. 350]

(Pending—No Final Action Taken)

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(78) ENTRY INTO FORCE OF THE PATENT COOPERATION TREATY

The Patent and Trademark Office has received notification that the United Kingdom deposited its instrument of ratification for the Patent Cooperation Treaty (PCT) with the World Intellectual Property Organization (WIPO) in Geneva, Switzerland on October 24, 1977. This ratification fulfilled the requirements for entry into force of the PCT under Article 63 of the Treaty. Article 63 provides that the Treaty shall enter into force three months after eight States have deposited their instruments of ratification or accession, provided that at least four of the States have major patent activity as defined therein. The four countries with major patent activity which have ratified the Treaty are:

Federal Republic of Germany
Switzerland
United Kingdom
United States of America.

Ratifications or accessions to the PCT have also been deposited by:

Cameroon	Madagascar
Central African Empire	Malawi
Chad	Senegal
Congo	Togo.
Gabon	

Since the last required ratification was deposited on October 24, 1977, the Treaty will enter into force three months later, on January 24, 1978. It should be noted that the national PCT implementing legislation, Public Law 94-131 of November 14, 1975 (89 Stat. 685; 942 O.G. 177; and page 108 of the August 1976 issue of "Patent Laws") comes into force on the same day as the entry into force of the PCT. Therefore, Public Law 94-131 will also enter into force on January 24, 1978.

The date from which international applications under the PCT may be filed is currently expected to be in July of 1978; the exact date will be fixed by the Assembly of the PCT. The first meeting of the Assembly is currently expected to take place during April 1978. A copy of the PCT was published in the OFFICIAL GAZETTE on July 14, 1970 at 876 O.G. 341-388.

In view of the entry into force of the Patent Cooperation Treaty (PCT) on January 24, 1978 and the European Patent Convention (EPC) on October 7, 1977, applicants may now wish to prepare their national patent application papers for filing in the United States in the format required by the PCT and the EPC so that the application need not be later retyped and reformatted for PCT or EPC filing. The format requirements for applications under these two Treaties are identical. In the PCT most of these requirements appear in PCT Rule 11 while in the EPC the major requirements are found in EPC Rules 32 and 35.

Shortly after the PCT and Public Law 94-131 come into force, rule changes along the lines of those proposed in the OFFICIAL GAZETTE of February 8, 1977 (955 O.G. 350-363) will be promulgated which will make patent applications prepared in the PCT-EPC format completely acceptable as United States national patent applications.

Since applications may be filed and given a filing date under the EPC beginning June 1, 1978 and the PCT will be operational for the filing of international applications soon thereafter, applications which are currently being filed as U.S. national applications may serve as the basis for priority claims under these Treaties.

Preparation of United States national patent applications in PCT-EPC format is substantially possible today and may eliminate the need for reformatting and retyping the case if it is later filed as a PCT International application or an EPC European application.

There are only a few areas where present U.S. national format requirements conflict with PCT-EPC format requirements. The major differences are the sheet margins; page numbering, which, under PCT-EPC, is at the top; typing, which must be 1½ spaced under PCT-EPC; the location of the title and the abstract; and the drawing sheet size, which must be A4 (21 cm x 29.7 cm) under PCT-EPC. The Office will presently accept applications prepared on A4 size paper, with 1½ spacing between typed lines, page numbering at the top, and the title at the beginning of the abstract and description. In addition, if application papers are filed with the PCT-EPC margins, the margin requirements of 37 CFR 1.52(b) will not be enforced.

The only remaining format problems are the location of the abstract and the drawing sheet size. Under the PCT-EPC, the abstract must be on a separate sheet which follows the claims. For current filing the title and abstract can be placed on a separate sheet without a number, with the first page of the description also containing the title and being numbered as page 1. For a later PCT-EPC application the abstract can be placed last and numbered in sequence. Drawings may be prepared to comply with the present U.S. national drawing size requirements (8½ x 14 inch sheets) but with a

PCT-EPC sight size so that the sheets can later be cut down to A4 size.

Nov. 1, 1977. LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

[964 O.G. 24]

(79) SUBMISSION OF UNIFORM ASSIGNEE NAMES ON THE ISSUE FEE PAYMENT FORM PTOL–85b

The Patent and Trademark Office is experiencing problems when computer-sorting assignee names for the Patentee Index because of the non-uniform use of the names of certain companies and corporations on the issue fee payment form PTOL–85b. The use of different spellings or nomenclature for the same company requires the Office to expend time and effort to determine whether the various name forms are in fact for the same company. If such inconsistencies are not corrected, patents to the same company will appear in different locations in the Patentee Index. An example of inconsistent use is "ABC Company, Ltd." and "ABC Co., Limited."

Therefore, persons who list assignee names on issue fee payment form PTOL–85b should ensure that the same company name form is used for all patents issuing to a particular company.

RICHARD J. SHAKMAN,
Nov. 17, 1977. *Assistant Commissioner for Administration.*

[965 O.G. 8]

(80) EXTENSION OF TIME LIMIT

This notice is intended to clarify certain misunderstandings and indicates the treatment given to requests for an extension of time in a situation where applicant has been given a time limit to complete an otherwise incomplete but bona fide attempt to respond to the previous Office action and advance the case to final action.

According to 37 CFR 1.135(c) when the applicant has filed a response to an examiner's action but consideration of some matter or compliance with some requirement has been inadvertently omitted, an opportunity to explain and supply the omission may be given before the question of abandonment is considered. According to the M.P.E.P., Section 710.02(c), the examiner may give applicant one month or the remainder of the period for response, whichever is longer, to complete the response. Neither the regulation nor the M.P.E.P. indicate that this time can be extended.

Under the regulation, the missing matter or lack of compliance must be considered by the examiner as being "inadvertently omitted." Once an inadvertent omission is brought to the attention of the applicant, the question of inadvertence no longer exists. Therefore, any further time to complete the response would not be appropriate under 37 CFR 1.135(c). Accordingly, no extension of time will henceforth be granted in these situations.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.
Nov. 28, 1977.

[965 O.G. 14]

TRADEMARK NOTICES

(81) INTERVIEWS INVOLVING TRADEMARK APPLICATION

Interviews frequently result in a better understanding of the issues involved, shorten the prosecution and facilitate disposal of applications.

Interviews for discussion of registrability of the mark of a pending application will not be had before the first official Office action thereon and ordinarily not before filing the first response. Arrangements for an interview should be made in advance so that the Examiner may review the case and be familiar with the details involved.

Interviews on Friday will no longer be prohibited as a matter of policy but all interviews should be set at a time satisfactory to all parties concerned.

A memorandum summarizing the conclusions reached at the interview should be prepared by the Examiner and placed in the application file. The memorandum will be retained in the application file until the prosecution is completed. Such procedure will not, however, relieve the applicant of the responsibility of complying with the requirements of Trademark Rule 2.62.

HORACE B. FAY, JR.,
July 6, 1964. *Assistant Commissioner.*

This supersedes the notice of February 10, 1958, 728 O.G. (TM 1).

[804 O.G. TM 147 (July 28, 1964)]

(82) POWERS OF ATTORNEY IN REGISTERED TRADEMARK FILES

On and after February 1, 1967, communications advising of changes in the powers of attorney for registered trademarks will be placed in the registration files, but will not be acknowledged by the Patent Office. The information will thus be available to those who inspect the files, but since these powers of attorney do not directly concern the Patent Office, acknowledgments are not believed to be necessary.

C. M. WENDT,
Jan. 30, 1967. *Director.*

[835 O.G. TM 95 (Feb. 21, 1967)]

(83) PREFACE TO THE TRADEMARK O.G. NOTICES

In September 1970, a Public Advisory Committee for Trademark Affairs was established by the Secretary of Commerce. The Purpose of this Committee was to advise the Patent Office on ways to increase the efficiency and effectiveness of the administration of the Trademark Act. A report of this Advisory Committee has been received by the Commissioner of Patents. After reviewing the recommendations, although the review is not complete, it has been decided to make certain changes in trademark practice and procedure, and to propose changes in the rules of practice. Beginning with this issue of the OFFICIAL GAZETTE and in subsequent issues as needed, announcements will be published concerning changes in procedures and proposed amendments to the Trademark Rules of Practice.

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WILLIAM E. SCHUYLER, JR.,
June 16, 1971. *Commissioner of Patents.*

Published in 36 F.R. 13232; July 16, 1971

[889 O.G. TM 2 (Aug. 3, 1971)]

(84) REQUEST FOR EXTENSION OF TIME IN WHICH TO OPPOSE

The Patent Office is adopting a new procedure to be used when filing a request for an extension of time in which to oppose under Section 13 of the Trademark Act and Rule 2.102, Trademark Rules of Practice. All requests for extension of time should be submitted in triplicate. The Patent Office will stamp each copy of the request with the action taken and send a copy to the requester and the applicant. The third copy will be entered in the file.

The purpose of this new procedure is to expedite the handling of extensions of time by eliminating the preparation of a formal notice of the disposition of the request. Further, this procedure will provide the applicant with additional information concerning the potential opposition.

WILLIAM E. SCHUYLER, JR.,
June 16, 1971. *Commissioner of Patents.*

Published in 36 F.R. 13232; July 16, 1971

[889 O.G. TM 3 (Aug. 3, 1971)]

(85) INITIAL PROCESSING OF APPLICATIONS

On February 1, 1972, the operations of the Trademark Application Section of the Patent Office will be reorganized. The purpose of the reorganization is to provide the public and applicants with more current information concerning newly filed applications.

The prompt initial processing of trademark applications is necessary in order to fulfill one of the main Patent Office functions, that of producing a record, accessible to the public, of new trademark activity to facilitate the clearance of new marks for use, determine the registrability of proposed marks, and avoid conflicts with the rights of others. In order to maintain a record of marks applied for which reflects the most current information available to the Office concerning them, the early processing of drawings in order to have them placed in the search room is considered as a first priority. The processing of these drawings includes the assignment of serial numbers, initial classification, duplication of the drawing and the forwarding of copies of the drawing to the search room. Other functions which are necessary in the processing of applications, such as the processing and mailing of filing receipts, are secondary to the processing of drawings.

In past years, there have been delays in processing applications and forwarding application drawings to the search room. These delays have varied from several weeks to several months. In view of the importance, both to applicants and the public, of recording essential information concerning newly filed applications as quickly as possible, a reorganization of the workflow in the Application Section is being effected.

There is no change in the processing of applications through the mail room and finance branch to the Application Section. However, under the new plan, upon receipt in the Trademark Application Section, all applications will be stamped with a serial number, and the drawing of the mark will be reproduced immediately and placed in the search file. This processing will occur as soon as the application files reach the Application Section. Such procedures as determining whether or not an application will receive a filing date, preparation of the file jackets, and mailing of the filing receipt will take place at a later time.

Applicants who wish to be notified promptly of the date their papers were received in the office and their serial number, may send two self-addressed postcards with their application papers. The mail room will stamp both postcards with the date of receipt and return one to the applicant; the second postcard will be stamped with the serial number and forwarded to the applicant from the Application Section. The postcards should contain the applicant's name and the trademark which is the subject of the application. When more than one set of application papers are forwarded under one cover, postcards should be attached to each set of papers for which a receipt is desired.

Under the new system of processing application papers, your particular attention is directed to the following changes as compared to the present procedure.

1. Application drawings will be placed in the public search file prior to the mailing of the filing receipt.

2. By using the postcard system described above, applicants will be notified sooner of the date of receipt of their papers and the serial number of their application. Applicants are encouraged to use the postcard system.

3. Additional papers sent in by the applicant or attorney should be identified by serial number, thereby enabling the office to process these papers quickly.

4. When an application is accompanied by a petition to the Commissioner under § 2.146, the petition will not be considered until processing by the Application Section is complete.

Effective date. The procedure outlined in this notice will become effective February 1, 1972.

RICHARD A. WAHL,
Jan. 11, 1972. *Acting Commissioner of Patents.*

Approved:

JAMES H. WAKELIN, JR.,
Assistant Secretary for Science and Technology.

Published in 37 FR 942; Jan. 21, 1972

[895 O.G. TM 193 (Feb. 22, 1972)]

(86) PETITION TO MAKE TRADEMARK APPLICATIONS SPECIAL

The practice of expediting the prosecution of new trademark applications on request of the applicant (accelerated prosecution) was rescinded, effective Aug. 1, 1971 (36 F.R. 13231, July 16, 1971; 825 O.G. 2). This action was taken after a careful study of the practice, including a recommendation of the Public Advisory Committee for Trademark Affairs that the Patent Office terminate accelerated prosecution of trademark applications. The study considered both the effect of the procedure on the workload of the Trademark Operations and the broader interest of examining trademark applications in an order which is equitable to all applicants.

Since the termination of this practice, the Office has experienced some increase in the number of petitions requesting the Commissioner to invoke his supervisory authority pursuant to Rule 2.146 in order to advance the examination of applications out of their regular order. This was to be expected since applicants who might have been able to show special circumstances entitling them to advanced examination could previously achieve this special treatment without resorting to a petition. However, some of the petitions now being received are not considered sufficient to justify the extraordinary relief of invoking the supervisory authority of the Commissioner for the purpose of advancing the applications out of their regular order.

In particular, a number of such petitions have been based on the ground that the applicant is about to embark on an advertising campaign or to commit advertising or promotional expenditures in which the mark applied for is material. Such a ground is not considered to constitute appropriate circumstances justifying the advancement of the application out of its regular turn and the petitions based on such ground have been and will continue to be denied. The principal reason for the denial is that these circumstances are applicable to a substantial portion of the trademark applications filed in the Patent Office. The supervisory authority of the Commissioner should be exercised only where an extraordinary reason for such action has been disclosed. See *Anderson & Dyer* v. *Lowry*, 89 O.G. 1861, 1899 C.D. 230, and *Wilputte* v. *Van Ackeren*, 103 USPQ 235. Thus, the extraordinary remedy of invoking the supervisory authority of the Commissioner is not considered appropriate under these circumstances.

In the interest of equitable treatment of all applicants, the policy of the Office in granting such petitions will be restricted to those cases in which particular and very special circumstances exist, such as a demonstrable possibility of loss of substantial rights, rather than circumstances which would be equally applicable to a large number of other applicants for trademark registration.

ROBERT GOTTSCHALK,
Commissioner of Patents.

Date: Mar. 13, 1972.

[897 O.G. TM 2 (Apr. 4, 1972)]

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(87) TRADEMARK REGISTRATION TREATY

At the conclusion of the Vienna Diplomatic Conference on industrial property, the Trademark Registration Treaty was signed on June 12, 1973 for the United States. This Treaty is designed to simplify the procedures for obtaining international registration of trademarks for United States companies doing business abroad.

The Treaty was unanimously adopted at the final plenary session. In addition to the United States, the United Kingdom, the Federal Republic of Germany, Italy, Portugal, Hungary, San Marino and Monaco also signed. Some forty-six countries were represented at the Conference. In their closing statements most of the other delegations present indicated their hope to sign before the end of the year. The Treaty remains open for signature through December 31, 1973. The Treaty will enter into force six months after five States have deposited their instruments of ratification or accession.

The negotiations at Vienna represent the climax of the work of several committees of experts and working groups which have met at Geneva since 1970 with the assistance of the World Intellectual Property Organization (WIPO). The U.S. delegation to the Vienna Conference was com-

posed of officials from the Department of State, the U.S. Patent Office and advisors from the private sector. Previous versions of the proposed Treaty were published on February 22, 1972; September 19, 1972; and February 20, 1973; in the OFFICIAL GAZETTE of the U.S. Patent Office. Published in this issue is the complete text of the Trademark Registration Treaty and its Regulations, as adopted by the Conference. For convenience, in addition to the text of the Articles and Regulations as adopted there is included a table of contents at the end of each section.

Additional copies of this material are available upon request to the Commissioner of Patents.

ROBERT GOTTSCHALK,
June 22, 1973 *Commissioner of Patents.*

[912 O.G. TM 205 (July 24, 1973)]

(88) WORDING IN VERIFICATION OR DECLARATION OF TRADEMARK APPLICATION

Applicants and attorneys are requested to use the following wording in the part of the verification or declaration of the trademark application which indicates the signer's belief that the mark applied for does not resemble another person's mark:

> —that no other person, firm, corporation, or association, to the best of his knowledge and belief, has the right to use such mark in commerce either in the identical form thereof or in such near resemblance thereto *as to be likely, when applied to the goods of such other person, to cause confusion, or cause mistake, or to deceive:*—

The wording emphasized conforms to the present language of both Sections 1(a)(1) and 2(d) of the Trademark Act of 1946.

Some applicants and attorneys, instead of using the wording emphasized above, are still using the now obsolete wording "as might be calculated to deceive" which was promulgated in the forms under the Trademark Act of 1905 and inadvertently continued by the Act of 1946 up to October 1962 in Section 1(a)(1) and in the forms connected with the Act. Section 1(a)(1) of the 1946 Act was amended by Act of October 9, 1962 (Public Law 772, 87th Congress, 76 Stat. 769) to conform it to the language of Section 2(d) of the 1946 Act, since the language of Section 2(d) reflects the thinking at the time the 1946 Act was written. The wording of the trademark forms for the 1946 Act has also been amended appropriately.

It is desirable that proper wording be used. However, since the differences in wording referred to above are considered to be differences of form rather than of substance, Examiners will not require new verifications or declarations. When the obsolete wording is observed and a letter is to be written for other reasons, Examiners will at that time call attention to the fact that the wording is obsolete and should be modified in applications in the future.

RENE D. TEGTMEYER,
Mar. 25, 1974. *Assistant Commissioner for Trademarks.*

[921 O.G. TM 186 (Apr. 23, 1974)]

(89) TRADEMARK APPLICATION UNDER SECTION 44 WITHOUT SPECIMENS AND USE

A significant number of applications are being filed under Section 44 of the Trademark Act of 1946 without specimens and without a statement of use, on the basis of the decision in *John Lecroy & Son, Inc.* v. *Langis Foods Limited,* 177 USPQ 717 (TT&A Bd. 1973), so that it appears desirable to provide the public with information as to the manner in which the Patent Office is handling such applications. This procedure has been incorporated into the Trademark Manual of Examining Procedure. However, since the Manual is not yet ready for distribution, this notice is being published at this time.

The memorandum which is being sent with the filing receipt to each applicant who falls within the above circumstances explains the procedure and reads as follows:

U.S. Department of Commerce
PATENT OFFICE

Trademark Application Filed Under Section 44 of the Act of 1946;

(No Allegation of Use and No Specimens)

MEMORANDUM TO ACCOMPANY FILING RECEIPT

The decision in *John Lecroy & Son, Inc.* v. *Langis Foods Limited,* 177 USPQ 717, rendered by the Trademark Trial and Appeal Board on May 7, 1973, appears to indicate that use and specimens should no longer be requisites for applications under Sections 44(d) and 44(e) of the Trademark Act. That decision has, however, been appealed to the United States District Court for the District of Columbia.

In view of the civil action filed in this case, use and specimens as requirements for such applications are not being eliminated. The Office is therefore assigning to the above-identified application a filing date which is conditional upon the ultimate decision in the above case of *Lecroy* v. *Langis,* and is mailing a filing receipt. However, this application will not be forwarded for examination until the decision in the case becomes final. A copy of the drawing will be placed in the search room with the following stamped thereon: "Withheld from Examination—Sec. 44."

The applicant has the following alternatives:

If applicant files specimens and a statement that the mark is in use (such statement being verified or in the form of a declaration under Rule 2.20), the application will be forwarded for examination with a filing date of the date of receipt of the specimens.

If a statement of use and specimens are not filed, the application will be withheld from examination until termination of the appeal of the above decision. If the decision is affirmed, the application will be forwarded for examination. If the decision is reversed, the application will become an informal application and the papers will be returned.

C. M. WENDT,
Mar. 22, 1974. *Director, Trademark Examining Operation.*

RENE D. TEGTMEYER,
Apr. 4, 1974. *Assistant Commissioner for Trademarks.*

[921 O.G. TM 250 (Apr. 30, 1974)]

(90) REALIGNMENT OF PATENT OFFICE HANDLING OF OPPOSITION PAPERS

In order to increase efficiency in processing papers, all activities connected with the handling of oppositions have been transferred from the Trademark Examining Operation to the Trademark Trial and Appeal Board. As a result of the transfer, requests for extension of time to oppose and matters pertinent thereto are now received and processed by the staff of the Trademark Trial and Appeal Board rather than by the staff of the Office of the Director of the Trademark Examining Operation.

No substantial change in procedure in the handling of papers relative to oppositions and extensions of time is contemplated by this realignment of duties in the Patent Office. Reasonable requests for extensions of time to oppose will continue to be granted with liberality particularly if there is no protest by another party and if the parties are negotiating or otherwise exploring bases for settlement, and fees for both verified and unverified oppositions will continue to be required to be filed within the time prescribed for opposing.

RENE D. TEGTMEYER,
Nov. 14, 1974. *Assistant Commissioner for Trademarks.*

[929 O.G. TM 62 (Dec. 10, 1974)]

(91) CONFERENCE OF PARTIES IN TRADEMARK INTER PARTES PROCEEDINGS

Under the inter partes rules of procedure in trademark cases effective July 1, 1972 (898 O.G. TM 170, May 16, 1972), the interlocutory phases of trademark inter partes proceedings are becoming increasingly involved, and the experience of the Trademark Trial and Appeal Board has been that the difficulties in such proceedings can frequently be resolved

more satisfactorily and quickly by conference in person than by correspondence or telephone. Therefore, effective immediately, the following practice is being adopted:

> Whenever it appears to the Trademark Trial and Appeal Board that questions or issues arising during the interlocutory phase of a trademark inter partes proceeding have become so complex that their resolution by correspondence or telephone is not practical and would be likely to be facilitated by conference in person of the parties and/or their attorneys with a member or members of the Trademark Trial and Appeal Board, the Board may at its discretion suggest that the parties and/or their attorneys, under circumstances which will not result in undue hardship for any party, meet with the Board at its offices in Crystal Plaza, Arlington, Virginia, to discuss the resolution of difficulties.

C. MARSHALL DANN,
Feb. 3, 1975. *Commissioner of Patents and Trademarks.*

[932 O.G. TM 2 (Mar. 4, 1975)]

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(92) INTERNATIONAL TRADEMARK CLASSIFICATION

At its November 3–6, 1975 meeting, the Committee of Experts of the Nice Agreement decided to conduct a systematic overall review of the Classification. A working Group will consider all proposals for changes in the Classification submitted by the member countries and certain international and intergovernmental organizations. The entire review is expected to require 2 to 3 years. The Group's recommendations will then be submitted to the Committee of Experts which will determine the actual changes to be made. Concurrently, an Ad Hoc Committee will prepare a revision of the Nice Agreement, particularly with respect to Article 3(3), the unanimity rule.

Suggestions for changes were submitted to the Patent and Trademark Office last year when a general review of the Classification was first contemplated. Additional suggestions will be welcomed by the Office for consideration in the preparation of proposed changes to be submitted to the Committee of Experts. The Committee has requested that proposals be accompanied by an explanation of why the change is warranted. Suggestions should be sent, by March 5, 1976, to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Attention: Office of Legislation and International Affairs, Room 1108, CP–6

BERNARD A. MEANY,
Jan. 16, 1976. *Assistant Commissioner for Trademarks.*

[943 O.G. TM 135 (Feb. 17, 1976)]

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(93) INTERNATIONAL PROTECTION OF GOVERNMENT EMBLEMS AND SEALS

Change of Intent

The Patent and Trademark Office, Department of Commerce, intends to forward only the 50 State seals plus one departmental seal for each department listed in the publication "Seals and Other Devices in Use at the Government Printing Office" ("Seals") instead of the entire publication, as indicated on page 59366 of the Federal Register of December 23, 1975.

Since the publication had been printed in 1975, it was assumed that few deletions and additions would be necessary. However, the response to the above notice, along with some necessary deletions, resulted in a large number of seals in the publication requiring deletion. This rendered the publication unacceptable for submission to the World Intellectual Property Organization (WIPO).

Therefore, the Patent and Trademark Office now intends to forward only the 50 State seals along with the departmental seal denoted "No. 1" for each department listed in the "Seals" publication. If this is not the preferred departmental or State seal, the department or State involved is requested to notify the Patent and Trademark Office by September 21, 1976. This notification should either specify the number of the preferred seal, as it appears in the "Seals" publication, or provide a clear, black and white photograph, suitable for reproduction, of the preferred seal. The seal must be no larger than 1½ inches in diameter.

These seals will then be forwarded to WIPO for protection under Article 6*ter* of the Paris Convention for the Protection of Industrial Property.

Address all correspondence to: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Dated: August 18, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Published in 41 F.R. 35741

[950 O.G. TM 114 (Sept. 21, 1976)]

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(94) PROPOSAL FOR DISTRIBUTION OF TRADEMARK SECTION 8 AND 15 INDEX CARDS TO PRIVATE FIRM

The Patent and Trademark Office received a request from TCR Service, Inc. for index cards which indicate the acceptance of an affidavit under Section 8 and the acknowledgment of an affidavit under Section 15. These cards are currently used by the Patent and Trademark Office to update the Search Room records and then the cards are destroyed.

TCR Service, Inc. has agreed that if the Patent and Trademark Office will provide them with the cards, they will maintain the cards for a six month period after receipt and make them available without charge to any person desiring to use them. After six months, the cards will be destroyed.

Any person having an objection to this proposed procedure should notify the Commissioner of Patents and Trademarks within 60 days from the date of this notice. After that time, the Patent and Trademark Office will announce their decision.

BERNARD A. MEANY,
Mar. 15, 1977. *Assistant Commissioner for Trademarks.*

[957 TMOG 8 (Apr. 12, 1977)]

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(95) LATE FILED FEES FOR SECTION 8 AFFIDAVITS/DECLARATIONS AND NOTICES OF OPPOSITION IN TRADEMARK CAUSES

The Commissioner has been receiving a large number of Trademark petitions requesting the acceptance of late-filed fees for Section 8 affidavits or declarations and oppositions. Prior practice has permitted the petitioner merely to assert oversight on his, or a subordinate's, part and the petition has been granted. However, to accept a late-filed fee requires a waiver of a trademark Rule of Practice and Rule 2.148 must be followed in making such a waiver. Rule 2.148 does permit the waiver of a rule that is not a statutory requirement (and these fee rules are not) but three conditions must be met:

1. An extraordinary situation exists;
2. Justice requires the waiver; and
3. No other party will be injured.

Cases and authorities consistently have held that an oversight or omission that could have been prevented by the exercise of ordinary care is not an extraordinary situation—see, for example, *Black's Law Dictionary* (Revised 4th ed. 1951) and *Brady* v. *Baltimore and Ohio R. Co. et al.*, 56 F.2d 231 (N.D. W. Va. 1932), cert. denied, 287 U.S. 610 (1932). Such an oversight is thus one that is not within the purview of Rule 2.148 and one that should not allow relief in these petitions. Several factors, however, are recognized:

1. The standard of Rule 2.148 is arduous and may be too rigid for certain situations like fees; and
2. For some time now, pursuant to *In re Kleiner*, 185 USPQ 362 (Comr. Pat. 1975) in Section 8 fee cases and pursuant to a desire to be consistent with prior unpublished decisions in connection with late opposition fees, the Office has been accepting this naked assertion of oversight as sufficient.

With reference to item 1, we are considering amending the rules to accept late filed opposition fees and Section 8 affi-

davit fees without the necessity of petitioning the Commissioner nor complying with Rule 2.148. Such a provision might be extended to those few ex parte appeal cases where the papers themselves were timely filed, but the required fee was inadvertently omitted.

We are considering a system where the notice of deficiency now being sent to the party would set a time period in which the required fees could be submitted without petitioning the Commissioner. We are also considering the possibility of an additional fee for this service.

The thinking behind this approach is that fees are ministerial and substantive rights generally should not be denied due to failure to comply with a ministerial function. Thus, it is felt that this proposal will work toward the ends of justice while still supporting the orderly administration of the Office.

With reference to item 2, it is hereby noted that until the rules are amended, or the proposal rejected, the Office will treat petitions concerning late filed fees as they have been to date. Some petitioners have already been informed of this in individual decisions. In other words, *In re Kleiner* is still a viable and citable authority.

Since this approach would directly affect practice before the Office, the Commissioner solicits any views the public may have on any aspect of this proposal. Interested parties are requested to submit their written evaluation to the Assistant Commissioner for Trademarks within sixty days from the date of this notice. Those views will be considered in structuring any proposed rule changes. Naturally, the established procedure (i.e. publication in the Federal Register, etc.) will be followed in processing any such proposed rule change.

It is appropriate to note here that the rules are designed to provide an orderly procedure and parties practicing before this Office, as well as the personnel of this Office, are entitled to rely on their being followed. In situations other than those noted above, deviations from the rules must be justified by circumstances meeting the requirements of Rule 2.148 *in toto*. The Bar is reminded that requests for waivers of the rules must be supported accordingly.

BERNARD A. MEANY,
Assistant Commissioner for Trademarks.

[958 TMOG 6 (May 10, 1977)]

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(96) TRADEMARK APPLICATIONS UNDER SECTION 44 OR THE TRADEMARK ACT OF 1946

[37 CFR Parts 2 and 4]

Proposed Rulemaking

AGENCY: Patent and Trademark Office, Commerce:

ACTION: Proposed rulemaking.

SUMMARY: This notice invites written comment on a Patent and Trademark Office proposal to amend the rules of practice and forms for trademark cases filed under section 44 of the Trademark Act of 1946. The proposed changes are being made because of the decision by the Court of Appeals for the District of Columbia Circuit in *SMC Corporation* v. *Langis Foods Ltd.*, 539 F. 2d 196, 190 USPQ 288 (1976). The effect of the proposed amendments is to eliminate the requirement for an allegation of use of the mark and the submission of specimens showing use of the mark in the case of applications for trademark registration which are based on a foreign application or registration. The proposed changes would require the applicant to submit a certified copy of his foreign application if he is claiming a right of priority based on that foreign application. Furthermore, the identification of goods and services may only include goods or services on which the applicant is using the mark, or has a bona fide intention to use the mark.

DATES: Comment must be received on or before November 1, 1977. Requests to speak at the hearing by October 17, 1977. Hearing date October 26, 1977, 9:30 am., e.d.t.

ADDRESSES: Comments may be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231. All comments received will be available for public inspection in Room 11E10, Crystal Plaza, Building 3, 2021 Jefferson Davis Highway, Arlington, Va.

HEARING LOCATION: Room 11C24, Crystal Plaza, Building 3, 2021 Jefferson Davis Highway, Arlington, Va. 22202.

FOR FURTHER INFORMATION CONTACT: C. Morten Wendt, Patent and Trademark Office (703–557–3268).

SUPPLEMENTARY INFORMATION: On April 30, 1974, at 921 O.G. TM 250, notice was published that trademark applications filed under section 44 of the Act of 1946 without specimens and without a statement of use would receive a filing date conditional upon the ultimate decision in the civil action which was brought to review the decision of the Trademark Trial and Appeal Board in *John Lecroy & Son, Inc.* v. *Langis Foods Limited*, 177 USPQ 717 (1973).

The civil action was finally determined by the Court of Appeals for the District of Columbia Circuit sub nom. *SCM Corporation* v. *Langis Foods Ltd.*, 539 F. 2d 196, 190 USPQ 288 (1976). The court stated that the issue of whether an applicant filing an application under the provisions of section 44(d) of the Trademark Act need allege use of the mark was not presented to the District Court or to the Court of Appeals in the case it decided. Therefore, the issue of whether an applicant filing an application under the provisions of section 44 of the Trademark Act need allege use of the mark somewhere and submit specimens to show such use remains for determination.

The last ruling by the Patent and Trademark Office was *John Lecroy & Son, Inc.* v. *Langis Foods Ltd.*, 117 USPQ 717 (TTAB 1973) in which the Board stated "There is nothing in the Act authorizing the Patent Office to require of a foreign applicant under section 44(d) use of his mark prior to the filing of his application in his home country * * *," page 719. The Board expressly overruled *In re Certain Incomplete Trademark Applications* 137 USPQ 69 (Comr. Pats. 1963), which held that an allegation of use of the mark somewhere and specimens were required. This reversed the ruling of *Ex parte Society Fromageries Bel*, 105 USPQ 392 (Comr. Pats. 1955), which had reversed the ruling of *Ex parte British Insulated Callender's Cables Ltd.*, 83 USPQ 319 (Comr. Pats. 1949).

The Court of Appeals in *SCM Corporation* v. *Langis Foods Ltd., supra*, held that under section 44(d) of the Trademark Act a foreign applicant obtained a constructive use date in the United States as of the filing date of the first application in a convention country.

In light of that decision, it is proposed that the Commissioner rescind the policy set forth in *In re Certain Incomplete Trademark Applications, supra*, to reflect the concept that a filing in a foreign country creates a constructive use of the trademark in the United States sufficient for filing an application under section 44(d) of the Trademark Act. Likewise a foreign registration would be construed to be constructive use for the purpose of filing an application under section 44(d) of the Act. Accordingly, an application filed under section 44 need not allege use of the mark or be accompanied by specimens. However, the applicant filing under section 44(d) would be required to submit a certified copy of the application which is the basis of a priority claim and the applicant filing under section 44(e) must still submit a certification or certified copy of the registration in the country of origin of applicant.

The Lisbon revision of Article 4A of the Paris Convention, ratified by the United States on January 4, 1962, provides that a regular national filing in any Convention country shall give rise to a right of priority, whatever may be the subsequent fate of that application. Thus a foreign applicant may file in the United States, claiming priority under section 44(d) but relying on use in commerce rather than a registration under section 44(e).

Notice is hereby given that pursuant to the authority contained in section 41 of the Act of July 5, 1946 (60 Stat. 440, 15 U.S.C. 1123) and section 6 of the Act of July 19, 1952, as amended (85 Stat. 364, 88 Stat. 1949, 35 U.S.C. 6 as amended), the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by amending §§ 221.21, 2.39, 2.56, 4.1 and 4.7.

It is proposed to revise and amend the sections as follows (additions are indicated by arrows; deletions are bracketed):

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

1. By amending § 2.21(a) to read as follows:

§ 2.21 *Requirements for receiving a filing date.*

(a) Materials submitted as an application for registration of a mark will not be accorded a filing date as an application until all of the following elements are received:

* * * * *

(5) At least one specimen or facsimile of the mark as actually used ►, except that a specimen or facsimile is not required when § 2.39 is applicable◄;

* * * * *

2. By revising paragraphs (a) and (b) and by the addition of new paragraphs (c) and (d) to § 2.39 to read as follows:

§ 2.39 *Omission of* ►*allegations*◄ [*allegation*] *of use* [*in commerce*] *by foreign applicants.*

(a) The ►allegations◄ [allegation] that the mark is in use in commerce ►and that the specimens or facsimiles show the mark as actually used in connection with the goods◄, required by § 2.33(b), and the statements of the dates of applicant's first use ►and that the applicant has adopted and is using the mark shown in the accompanying drawing◄, required by § 2.33(a) (1) ►(iv)◄, (vii), and (viii), may be omitted in the case of an application filed pursuant to section 44(e) of the act for registration of a mark duly registered in the country of origin of a foreign applicant, provided the application when filed is accompanied by a ►certification or certified copy issued by◄ [certificate of] the trademark office of the [foreign] country ►of origin of applicant◄ showing that the mark has been registered in [the] ►that◄ country [of origin of the applicant] and also showing the mark, the goods for which registered and that said registration is then in full force and effect. If the ►certification or certified copy◄ [certificate] is not in the English language, a translation is required.

(b) Such allegations and statements may also be omitted in the case of an application claiming the benefit of a prior foreign application in accordance with section 44(d) of the act. The application in such case shall state the date and country of the first foreign application [and,] ►. A certification or certified copy issued by the trademark office of the country where the first foreign application was filed shall accompany the application or be submitted within such time as is specified by the office. The certification or certified copy shall show the mark, the goods for which the first foreign application was filed, and the date of filing thereof. If the certification or certified copy is not in the English language, a translation is required. Before◄ [before] the application can be considered as allowable ►in the absence of an allegation of use in commerce◄, there must be filed a ►certification or certified copy issued by◄ [certificate of] the trademark office of the [foreign] country ►of origin of applicant◄ showing that the mark has been registered in [the] ►that◄ country [of origin of the applicant] and also showing the mark the goods for which registered and the date of ►issue of the registration. If the certification or certified copy is not in the English language, a translation is required.◄ [filing of the application. In such cases the specification of goods shall not exceed the scope of that covered by the foreign registration or application.] In the event the application is based upon a subequent regularly filed application in the same foreign country the application must so state and must show that any prior filed application has been withdrawn, abandoned or otherwise disposed of, without having been laid open to public inspection and without having any rights outstanding, and has not served as a basis for claiming a right of priority.

►(c) The foreign application or the foreign registration, which is the basis of a claim to registration under section 44(d) or 44(e) of the act, shall be deemed to be constructive use of the mark for the purpose of filing an application under the act.◄

►(d) The specification of goods identified in an application filed under section 44(d) or 44(e) of the act shall not exceed the scope of that covered by the foreign application or registration, and, furthermore, such identification of goods in the application under the act shall include only those goods on or in association with which the applicant is actually using the mark or has a bona fide intention to use the mark on the filing date of the application under the act.◄

3. By revising § 2.56 to read as follows:

§ 2.56 *Specimens.*

The application must include five specimens of the trademark as actually used on or in connection with the goods in commerce. The specimens shall be duplicates of the actual used labels, tags, or containers, or the displays associated therewith or portions thereof, when made of suitable flat material and of a size not to exceed 8½ inches (21.6 cm.) wide and 13 inches (33.0 cm.) long. ►Specimens are not required when § 2.39 is applicable, but if commercial specimens are available, the applicant is encouraged to submit such specimens.◄

PART 4—FORMS FOR TRADEMARK CASES

4. By amending the "Notes" following § 4.1 by renumbering paragraph (2) as (2)(b), paragraph (3) as (3)(b), and paragraph (5) as (5)(b) and adding subparagraphs (2)(a), 3(a), and 5(a) to read as follows:

NOTES.—[Amended]

►(2)(a) A foreign applicant relying upon section 44(d) or 44(e) of the act shall specify only those goods which are comprehended within the identification of goods of the foreign application or registration upon which he relies and on which, on the filing date of the application, he is actually using the mark or has a bona fide intention to use the mark.◄

* * * * *

►(3)(a) A foreign applicant relying upon section 44(d) or 44(e) of the act may omit the allegations of the date of first use of the mark, the date of first use of the mark in commerce and that the mark is now in use in such commerce.◄

* * * * *

►(5)(a) A foreign applicant relying upon section 44(d) or 44(e) of the act who does not allege use of the mark may omit specimens and an allegation that specimens showing the mark as actually used are presented with the application, but if commercial specimens are available, the applicant is encouraged to submit such specimens.◄

* * * * *

5. By amending the "Notes" following § 4.7 by renumbering paragraph (12) as (12)(a) and adding subparagraph (b) to read as follows:

NOTES [Amended]

* * * * *

►(12)(b) A foreign applicant relying upon section 44(d) or 44(e) of the act who does not allege use of the mark may omit specimens and an allegation that specimens showing the mark as actually used as presented with the application, but if commercial specimens are available, the applicant is encouraged to submit such specimens.◄

Dated: July 22, 1977.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: August 3, 1977.

HOWARD I. FORMAN,
Acting Assistant Secretary for Science and Technology.

[FR Doc. 77-23095; Filed 8-9-77; 8:45 am]

[962 TMOG 2 (Sept. 6, 1977)]

(Pending—No final action taken)

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(97) TRADEMARK RULES OF PRACTICE

The ninth edition of the Trademark Rules of Practice, dated December 1976, is now available. It replaces the previous edition in its entirety.

The Rules are in looseleaf form so as to accommodate revisions. New subscriptions may be ordered from:

Superintendent of Documents
United States Government Printing Office
Washington, D.C. 20402.

The charge is $5.00 for domestic mailing and $6.25 for foreign mailing. Prior subscribers were sent a notice of expiration by the Government Printing Office in January, 1977.

The Rules booklet is available only by subscription. When revisions are issued, they are a part of the subscription and are mailed automatically. Revisions are announced in the OFFICIAL GAZETTE of the Patent and Trademark Office.

BERNARD A. MEANY,
Sept. 16, 1977. *Assistant Commissioner for Trademarks.*

[963 TMOG 12 (Oct. 18, 1977)]

(98) RECORDING OF "TERRITORIAL ASSIGNMENTS" IN THE ASSIGNMENT DIVISION OF THE PATENT AND TRADEMARK OFFICE

It has been the practice of the Assignment Division for many years to refuse to record "territorial assignments," that is, assignments purporting to transfer rights in a trademark registration (not a concurrent use registration) for less than the entire United States. Hereinafter, such documents will be recorded as long as the requirements of the Rules of Practice are met by the documents submitted.

The Office is not addressing the validity or effect of such documents by recording same, but is merely recognizing that such transfers may affect title to a registered mark and therefore ought to be recorded. At the time a Section 8 affidavit or declaration or an application for renewal is filed, the Examiner of Trademarks will consider the effect of such a document.

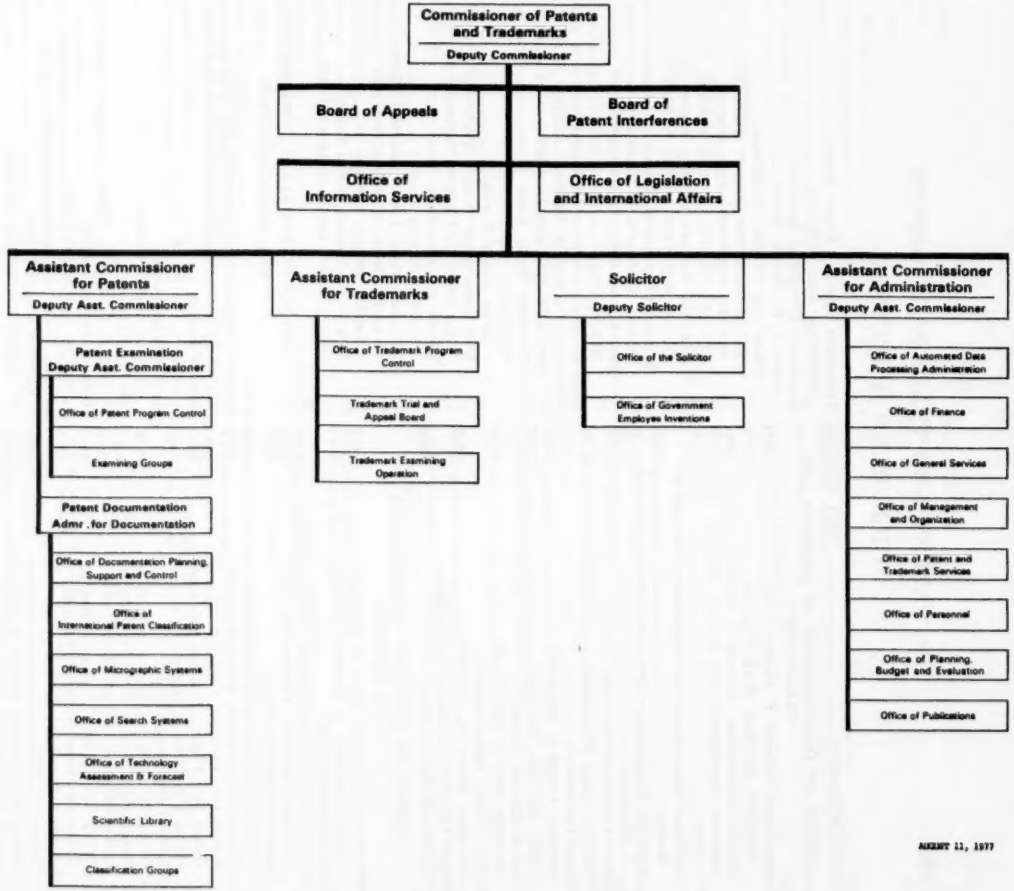
BERNARD A. MEANY,
Oct. 7, 1977. *Assistant Commissioner for Trademarks.*

[964 TMOG 8 (Nov. 8, 1977)]

(99)

U.S. DEPARTMENT OF COMMERCE
Patent and Trademark Office

Attachment to DOO 30-38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PATENT AND TRADEMARK OFFICE NOTICES

National Inventors Day

The Sixth Annual Inventors Day Exposition will be held on Saturday and Sunday, February 11 and 12, 1978 at the Patent and Trademark Office in Arlington, Virginia.

Limited space is available for appropriate display and demonstration of patented materials, devices or methods. Such limited space dictates early consideration by perspective participants. No application can be considered after January 20, 1978.

Other than electricity and allotted space—floor, wall or table top, all expenses must be borne by the exhibitor. Arrangements for delivery, return, set up and take down, as well as individual exhibits and personnel are the exhibitor's responsibility. Neither the Patent and Trademark Office nor individual employees can accept a collect shipment or provide storage.

The Patent and Trademark Office National Inventors Day Committee will select the items to be exhibited and allot available space. Suitability for dynamic demonstration and current public interest are prime consideration in selecting exhibits.

Inventors or firms interested in participating are encouraged to contact the National Inventors Day Committee (phone: 557–3428). Communications should be directed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attn: Oscar Mastin, Office of Information Services.

JOSEPH PETERS,
Dec. 7, 1977 *Chairman.*

National Inventors Day

The Patent and Trademark Office will be sponsoring National Inventors Day in the Public Search Room on Saturday, February 11, from 1:00 p.m. to 5:00 p.m. and Sunday February 12, 1978 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days and to attend a formal program at 2:00 p.m. on Sunday.

In order to accommodate the exhibits, it will be necessary to close the Public Search Room at 5:00 p.m. on Friday, February 10, 1978.

We would appreciate the cooperation of all users of the Search Room facilities in removing all personal items and belongings in order to permit the early closing time.

LUTRELLE F. PARKER,
Dec. 7, 1977 *Acting Commissioner of Patents and Trademarks.*

Registration to Practice

The following are names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before February 3, 1978:

Bicks, Mark S., 1900 S. Eads St., Arlington, Va. 22202
Burke, Allan R., 633 S. 22nd St., Arlington, Va. 22202
Deeth, Douglas N., 83 Orsett St., Oakville, Ont., Canada
Meitner, Pamela C., 2223A Prior Rd., Wilmington, Del. 19809
Miller, John R., Rte. 1, Owensville, Mo. 65066
Rader, Ralph T., 1898 Fairford Dr., Bloomfield Hills, Mich. 48013

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks and Chairman, Committee on Enrollment.
December 9, 1977.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,065,759, F. Lewis, HAIR STRAIGHTENING METHOD AND APPARATUS, **filed** July 27, 1977, D.C., S.D.N.Y., Doc. 77–C–3620, *Frederick Lewis* v. *Clairol, Incorporated, Bristol-Myers Company and Bettie E. Parham.*

3,091,912, Stoddard and Seem, METHOD OF PROCESSING STRETCH YARNS AND YARNS PRODUCED THEREBY, **filed** June 15, 1977, D.C., M.D.N.C. (Greensboro), Doc. C–77–284–G, *Lex Tex Ltd. Inc.* v. *Dow Badische Company.* **Same, filed** June 15, 1977, D.C., M.D.N.C. (Greensboro), Doc. C–77–285–G, *Lex Tex Ltd. Inc.* v. *Glen Raven Mills, Inc.* **Same, filed** June 15, 1977, D.C., M.D.N.C. (Greensboro), Doc. C–77–286–G, *Lex Tex Ltd. Inc.* v. *J. P. Stevens Company, Inc.* **Same, filed** June 15, 1977, D.C. M.D.N.C. (Greensboro), Doc. C–77–287–G. *Lex Tex Ltd. Inc.* v. *Burlington Industries,* Inc. **same, filed** June 15, 1977. D.C. M.D.N.C. (Greensboro), Doc. C–77–288–G. *Lex Tex Ltd. Inc.* v. *The Duplan Corporation.* **Same, filed** June 27, 1977, D.C., M.D.N.C. (Greensboro), Doc. C–77–310–G, *Lex Tex Ltd. Inc.* v. *Unifi, Inc.*

3,248,099, R. S. Bratko, INFRA-RED INDUSTRIAL OVEN; **3,785,763,** same, INFRA-RED BURNER; **3,824,064,** same, INFRA-RED PROCESS BURNER, **filed** July 14, 1977, D.C.N.J. (Camden), Doc. C–77–1417, *Hunt Associates, Incorporated* v. *Slyman Mfg. Corp., Thomas L. Esper, Rudolph S. Bratko and Bratko Corp.*

3,313,477, G. Brown, TRANSPARENT BANK CONSTRUCTION HAVING COIN SORTING MEANS, **filed** Jan. 16, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c128, *Superior Toy & Mfg. Co., Inc.* v. *M. Pressner & Co. et al.* Enter order granting final judgment on consent, Apr. 16, 1973.

3,322,296, N. S. Khoury, EASY OPENING CONTAINER, **filed** Dec. 23, 1976, D.C., E.D. Wis. (Milwaukee), Doc. 76–836, *Continental Group, Inc.* v. *Reynolds Metals Company.* Action transferred to the Northern District of Illinois, June 7, 1977.

3,426,960, P. Shore, PHONOGRAPH RECORD RECEIVING JACKET, **filed** Jan. 7, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c46, *Shorewood Packaging Corp.* v. *Album Graphics.* Pursuant to settlement agreement, order cause dismissed, Dec. 6, 1976.

3,474,779, W. H. Wall, Jr., DENTAL ARCH BAR FOR TREATING FRACTURES, **filed** July 28, 1977, D.C., N.D. Ga. (Atlanta), Doc. C77–1234A, *William H. Wall, D.D.S.* v. *Zimmer-USA, Inc.*

3,486,495, H. W. Allen, ARCHERY BOW WITH DRAW FORCE MULTIPLYING ATTACHMENT, **filed** Aug. 15, 1977, D.C., E.D. Ill. (St. Louis), Doc. CV77–0152–D, *Precision Shooting Equipment Co. and Paul E. Shepley, Jr.* v. *Holless W. Allen.*

3,491,590, B. K. Watkins, POWER STOPPER WEIGHT TRANSFER APPARATUS, **filed** Jan. 21, 1976, D.C., E.D. Wis. (Milwaukee), Doc. 76–38, *Billy K. Watkins* v. *Lloyd Luedtke and Luedtke Manufacturing, Inc.* Consent judgment enjoining defendants from infringement of said patents, Jan. 5, 1977. **Same, filed** Aug. 2, 1977, D.C. S.D. Ill. (Springfield), Doc. 77–3114, *Billy K. Watkins* v. *Oliver Schafer.*

3,597,771, C. H. Rickmeier, Jr., BEDPANS; **D. 216,059,** same, **filed** Oct. 5, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2498, *The Vollrath Co.* v. *Premium Plastics Inc.* Order complaint dismisse; defendant's counterclaims sustained, Sept. 3, 1974. Filed certified copy of order of U.S. Court of Appeals, order judgment of U.S. District Court affirmed, July 2, 1975.

3,611,035, E. S. Douglas, GROUND FAULT PROTECTIVE SYSTEM HAVING GROUNDED NEUTRAL PROTECTIVE; **3,813,570,** Doyle, Wahlgren and Douglas, ELECTRIC RECEPTACLE ASSEMBLY WITH GROUND FAULT PROTECTION; **3,836,821,** Wahlgren and Douglas, GROUND FAULT PROTECTIVE SYSTEM, **filed** Mar. 23, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c972, *Minnesota Mining & Manufacturing* v. *Fresen Associates Co. and Slater Electric, Inc.*

3,625,628, E. H. Byrns, CAPACITY CONTROL OPERATING MECHANISM FOR CENTRIFUGAL COMPRESSOR, **filed** Aug. 4, 1977, D.C., E.D. Mich. (Bay City), Doc. 77–10145, *Logging Development Corporation* v. *Morbark Industries, Inc.*

3,631,812, C. L. Winslow, Jr., FLEXIBLE HOPPER CLOSURE ACTUATING MECHANISM, **filed** July 11, 1977, D.C. E.D.N.C. (New Bern), Doc. 77–48–C–4, *Mary D. Winslow* v. *Winslow-Atkins Equipment Company.*

3,662,373, R. W. Schumann, INFORMATION DISPLAY SYSTEM; **3,787,666,** Schumann and Smith, same; **3,859,556,** R. W. Schumann, DIGITAL MEASUREMENT APPARATUS WITH IMPROVED EXPANDED DISPLAY, **filed** July 13, 1977, D.C., W.D. Wis. (Madison), Doc. 77-C-264, *Nicolet Instrument Corporation* v. *Norland Corporation.*

3,679,512, F. W. Macone, LAMINATED CARD ENVELOPE, **filed** Aug. 3, 1977, United States Court of Appeals for the First Circuit, Mass. (Boston), Doc. 77-1349, *Avant Incorporated* v. *Polaroid Corporation.*

3,679,840, A. R. Maxey, HELICAL SCANNING ASSEMBLY WITH TAPE TO SCANNER REFERENCING APPARATUS, **filed** Feb. 14, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c516, *Echo Science Corporation* v. *Robert Bosch GmbH, et al.* Complaint dismissed with prejudice, pursuant to Rule 41(a)(1), Mar. 28, 1977.

3,688,344, H. C. Carlson, IMPACT CLAM EXTRACTOR, **filed** July 29, 1977, D.C. Md. (Baltimore), Doc. K77-1239, *The American Original Corporation* v. *Carlson Extractors, Inc. and Harold C. Carlson.*

3,720,872, Russell and Gracie, POWER TRANSMISSION FAULT INDICATOR WITH AUTOMATIC RESET MEANS, **filed** Mar. 29, 1974, D.C.N.J. (Trenton), Doc. C-74-447, *Burndy Corporation et al.* v. *Edison Control Corp. et al.* Counsel reported settled, order of dismissal, Aug. 10, 1977.

3,729,084, Stuart and Brown, Jr., BRICK STOPPING AND GROUPING APPARATUS, **filed** Apr. 15, 1975, D.C., W.D.N.C. (Asheville), Doc. A-75-48, *Forrest Paschal Machinery Co.* v. *EA Industries, Inc.* Judgment defendant's apparatus charged to infringe said patent does not infringe said patent; that plaintiff's claim of infringement against defendant be dismissed with prejudice; that all other claims and counterclaims be dismissed without prejudice, Apr. 15, 1977.

3,738,005, Cohen and Silverman, METHOD AND APPARATUS FOR APPLYING ORTHODONTIC BRACKETS AND THE LIKE, **filed** July 25, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77-2786-AAH. *Ormco Corporation* v. *Indirecto Corp.*

3,739,780, R. W. Ogle, SAF-T-JET, **filed** Aug. 12, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77-3045-MML, *IMS Limited* v. *Abbott Laboratories, Inc.*

3,743,432, B. R. Lee, AUTOMATED PAVING MACHINE, **filed** Aug. 17, 1977, D.C., N.D. Ga. (Atlanta), Doc. C77-1366A, *Lee-Boy Manufacturing Co., Inc. v. R. Otis Pucket, J. Richard Pucket and Pucket Brothers Manufacturing Co.*

3,753,364, J. E. Runyan and G. M. Grover, HEAT PIPE AND METHOD AND APPARATUS FOR FABRICATING SAME, **filed** July 29, 1977, D.C.S.C. (Columbia), Doc. 77-1474, *Q-Dot Corporation* v. *Clemson University and Freeman Mechanical, Inc.*

3,785,763. (See 3,248,099.)

3,787,666. (See 3,662,373.)

3,789,210, Weber, Shroyer and Baker, RECESSED LIGHTED ASSIST BAR, **filed** Feb. 23, 1977, D.C., N.D. Ind. (South Bend), Doc. S-77-0030, *Progressive Dynamics, Inc.* v. *Conroth Company.* Cause of action is dismissed without prejudice pursuant to the order of this court, entered June 17, 1977.

3,813,579. (See 3,611,035.)

3,824,064. (See 3,248,099.)

3,835,543, Polydoris and Wollar, MEASURING INSTRUMENT, **filed** Sept. 8, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c3348, *ENM Company* v. *Transformer Manufacturers Inc. et al.* Enter stipulation and consent decree, enter writ of permanent injunction, Aug. 1, 1977.

3,836,821. (See 3,611,035.)

3,858,577, Bass, Dwyer and Haverback, FIBER OPTIC LASER LIGHT DELIVERY SYSTEM, **filed** Aug. 9, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77-2972-R, *University of Southern California* v. *Optics Technology, Inc., Syntel, Inc. and Cavitron Corp.*

3,859,556. (See 3,662,373.)

3,867,769, Schow and Abrams, ARC WELDING SIMULATOR TRAINER, **filed** Aug. 16, 1977, D.C., E.D. Mo. (St. Louis), Doc. 77-886C(1), *Lenco, Inc.* v. *Harvey B. Schow, Macy L. Abrams and Sim-U-Welder, Inc.*

D. 216,059. (See 3,591,771.)

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,459,315, Re. S.N. 842,697, Filed Oct. 17, 1977, Cl. 222/541, CLOSURE SPOUT HAVING TEAR-OUT PORTION, Maurice Labarre, Owner of Record: *Breskin Industries Corporation, White Plains, N.Y.,* Attorney or Agent: Lawrence Rosen, et al., Ex. Gp.: 311

3,467,754, Re. S.N. 846,873, Filed Oct. 31, 1977, Cl. 424/253, BRONCHODILATOR EXPECTORANT ELIXIR, Neil H. Mercer, et al., Owner of Record: *Mead Johnson & Company, Evansville, Ind.,* Attorney or Agent: Robert E. Carnahan, et al., Ex. Gp.: 125

3,478,397, Re. S.N. 844,454, Filed Nov. 2, 1977, Cl. 425/162, BRICK CUTTER AND HACKER, Florentin J. Pearne, et al., Owner of Record: *Pearne and Lacy Machine Company, Inc., Los Angeles, Calif.,* Attorney or Agent: Harold F. McNenny, et al., Ex. Gp.: 322

3,501,307, Re. S.N. 849,374, Filed Nov. 7, 1977, Cl. 96/101, PHOTOGRAPHIC REVERSAL MATERIALS CONTAINING ORGANIC DESENSITIZING COMPOUNDS, Bernard D. Illingsworth, Owner of Record: *Eastman Kodak Company, Rochester, N.Y.,* Attorney or Agent: Carl O. Thomas, et al., Ex. Gp.: 166

3,662,432, Re. S.N. 843,126, Filed Oct. 14, 1977, Cl. 17/53, APPARATUS FOR EVISCERATING SCALLOPS, Richard T. Wenstrom, et al., Owner of Record: *Slade Gorton & Co., Inc., South Boston, Mass.,* Attorney or Agent: Robert A. Cesari, et al., Ex. Gp.: 333

3,913,097, Re. S.N. 841,970, Filed Oct. 13, 1977, Cl. 340/384 E, SOUND SIMULATOR FOR MODEL STEAM ENGINE, Walter J. Schedler, Owner of Record: *Inventor,* Attorney or Agent: Rupert J. Brady, et al., Ex. Gp.: 234

3,916,832, Re. S.N. 847,322, Filed Oct. 31, 1977, Cl. 119/2, AQUACULTURE SYSTEM, Maxwell Patrick Sweeney, Owner of Record: *Inventor,* Attorney or Agent: Albert L. Gabriel, Ex. Gp.: 333

3,917,033, Re. S.N. 848,774, Filed Nov. 4, 1977, Cl. 188/73.3, SLIDING CALIPER DISC BRAKES, Heinrich Bernard Rath, et al., Owner of Record: *Girling Limited, Birmingham, England,* Attorney or Agent: Samuel Scrivener, Jr., et al., Ex. Gp.: 315

3,919,509, Re. S.N. 848,346, Filed Nov. 3, 1977, Cl. 200/61.62, ELECTRICALLY CONDUCTIVE PNEUMATIC SPRING WITH DOOR ACTUATED SWITCH MEANS, Klaus Schnitzius, Owner of Record: *Stabilus G.m.b.H., Koblenz-Neuendorf, Germany,* Attorney or Agent: Hans Berman, et al., Ex. Gp.: 217

3,955,657, Re. S.N. 847,616, Filed Nov. 1, 1977, Cl. 192/2, ELECTRIC TRACTION TRANSPORTATION SYSTEM WITH STORAGE BATTERY POWERED VEHICLES AND FAST RECHARGE AT THE VEHICLE STOPS, Oscar Bossi, Owner of Record: *Inventor,* Attorney or Agent: Milton M. Field, Ex. Gp.: 315

3,961,983, Re. S.N. 790,494, Filed Apr. 25, 1977, Cl. 134/8, APPARATUS AND METHOD FOR WASHING INTERIORS OF TRUCK AND TRAILER BODIES, Clyde O. Crandall, et al., Owner of Record: *Safeway Stores, Incorporated, Oakland, Calif.,* Attorney or Agent: Paul D. Flehr, et al., Ex. Gp.: 173

3,968,141, Re. S.N. 848,618, Filed Nov. 4, 1977, Cl. 260/468 K, PROCESSES FOR STEREOSPECIFICALLY PREPARING CHIRAL 2-SUBSTITUTED-4-HYDROXY-2-CYCLOPENTEN-1-ONE, Charles J. Sih, et al., Owner of Record: *Wisconsin Alumni Research Foundation, Madison, Wis.,* Attorney or Agent: Howard W. Bremer, Ex. Gp.: 126

3,972,399, Re. S.N. 849,193, Filed Nov. 7, 1977, Cl. 192/58 B, TEMPERATURE RESPONSIVE COUPLING, Warren G. Bopp, Owner of Record: *Eaton Corporation, Cleveland, Ohio,* Attorney or Agent: Paul S. Rulon, et al., Ex. Gp.: 345

4,027,504, Re. S.N. 832,495, Filed Sept. 12, 1977, Cl. 66/64, STITCH PRESSER FOR KNITTING MACHINE, Robert Dietschy, et al., Owner of Record: *Edouard Dubied et Cie. S.A., Neuchatel, Switzerland,* Attorney or Agent: Henry L. Brinks, et al., Ex. Gp.: 352

PATENT NOTICES

Certificates of Correction for the Week of Jan. 3, 1978

3,869,596	4,032,676	4,042,474	4,048,616
3,883,575	4,033,407	4,042,749	4,048,670
3,935,572	4,033,678	4,042,812	4,048,736
3,982,886	4,034,715	4,043,100	4,048,751
3,984,579	4,034,805	4,043,170	4,048,779
3,985,888	4,035,578	4,043,595	4,049,058
3,990,324	4,035,874	4,044,313	4,049,103
3,990,999	4,036,083	4,044,392	4,049,391
3,991,592	4,036,156	4,044,622	4,049,980
3,992,392	4,036,297	4,045,162	4,050,153
3,996,646	4,036,834	4,045,406	4,050,180
4,005,647	4,037,436	4,045,460	4,050,496
4,008,788	4,037,485	4,045,694	4,050,627
4,011,315	4,037,598	4,045,819	4,050,674
4,019,381	4,037,954	4,046,175	4,050,835
4,020,071	4,038,019	4,046,188	4,050,924
4,021,575	4,038,152	4,046,332	4,050,925
4,022,938	4,038,176	4,046,394	4,050,944
4,024,095	4,038,184	4,046,900	4,050,947
4,025,486	4,038,273	4,047,560	4,050,984
4,025,985	4,038,508	4,047,721	4,051,052
4,026,025	4,038,765	4,047,777	4,051,063
4,028,131	4,039,022	4,048,103	4,051,205
4,028,278	4,039,097	4,048,124	4,051,323
4,029,590	4,039,486	4,048,132	4,051,533
4,029,673	4,039,488	4,048,164	4,051,961
4,030,892	4,039,667	4,048,226	4,052,297
4,030,903	4,040,046	4,048,239	4,052,486
4,030,932	4,040,820	4,048,307	4,052,548
4,031,015	4,041,322	4,048,413	4,052,689
4,031,075	4,041,408	4,048,424	4,053,508
4,032,124	4,041,810	4,048,455	

Disclaimers

3,292,777.—*John D. Desmond,* Philadelphia, Pa. DISPLAY CARTON. Patent dated Dec. 20, 1966. Disclaimer filed July 25, 1977, by the assignee, *Container Corporation of America.*

Hereby enters this disclaimer to claim 7 of said patent.

3,485,227.—*George M. Meyerle,* South Ozone Park, N.Y. SWITCHING CIRCUIT. Patent dated Dec. 23, 1969. Disclaimer filed Nov. 2, 1977, by the assignee, *BSR (USA) Ltd.*

Hereby enters this disclaimer to the remaining term of said patent.

3,659,266.—*George M. Meyerle,* South Ozone Park, N.Y. BURGLAR ALARM SYSTEM. Patent dated Apr. 25, 1972. Disclaimer filed Nov. 2, 1977, by the assignee, *BSR (USA) Ltd.*

Hereby enters this disclaimer to the remaining term of said patent.

3,716,992.—*Jere F. Stahl,* Philadelphia, Pa. ADAPTOR FOR EXHAUST MANIFOLD. Patent dated Feb. 20, 1973. Disclaimer filed Nov. 11, 1977 by the inventor.

Hereby enters this disclaimer to claims 1, 2, 3, 4, and 5 of said patent.

3,850,835.—*Laurence B. Marantz,* Sherman Oaks and *Clifford M. Moran,* San Gabriel, Calif. METHOD OF MAKING GRANULAR ZIRCONIUM HYDROUS OXIDE ION EXCHANGERS, SUCH AS ZIRCONIUM PHOSPHATE AND HYDROUS ZIRCONIUM OXIDE, PARTICULARLY FOR COLUMN USE. Patent dated Nov. 26, 1974. Disclaimer filed Nov. 7, 1977, by the assignee, *CCI LIFE SYSTEMS, INC.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 10, 11, 12 and 13.

3,958,478.—*William John Camper,* Troy, Ohio. SHARPENER FOR COMMODITY SLICING MACHINE. Patent dated May 25, 1976. Disclaimer filed Nov. 3, 1977, by the assignee, *Hobart Corporation.*

Hereby enters this disclaimer to claims 1, 2, 3 and 9 of said patent.

3,965,955.—*Edward John Price,* Dunsley, England. GOLF CLUB HEAD COVERS. Patent dated June 29, 1976. Disclaimer filed Nov. 7, 1977, by the assignee, *Colgate-Palmolive Company.*

Hereby enters this disclaimer to the remaining term of said patent.

4,036,302.—*Dudley W. C. Spencer,* Wilmington, Del. HORSESHOE MANUFACTURE. Patent dated July 19, 1977. Disclaimer filed Nov. 8, 1977, by the inventor.

Hereby enters this disclaimer to Claim 10 of said patent.

Disclaimer and Dedication

3,965,157.—*Roger Garrick Harrison,* Hampshire, England. PREPARATION OF ALPHA-ACETOXY ALDEHYDES AND KETONES. Patent dated June 22, 1976. Disclaimer and Dedication filed, Nov. 7, 1977, by the assignee, *Lilly Industries, Limited.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

Service by Publication

Erich O. Kettner

In accordance with 37 CFR 1.47(a) (Rules of Practice in Patent Cases), notice is hereby given of the filing on August 31, 1976, of an application for patent entitled "Method and Apparatus For Reclaiming Tobacco From Cigarettes", on behalf of Erich O. Kettner, whose last known address is 655–H Westover Hills Boulevard, Richmond, Virginia, 23225. The application was made in compliance with 37 CFR 1.47(a) and 35 U.S.C. 116, second paragraph by Thomas A. Newman without execution by the said Erich O. Kettner. Notice of the filing directed to the above noted address has been returned undelivered.

Any action to be taken by the said Erich O. Kettner in connection with the said application must be taken within thirty (30) days of the publication of this notice.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents and Trademarks.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS
Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $3.50 ($7.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF COMMERCE

National Technical Information Service, Office of Government Inventions & Patents
Springfield, Va. 22161

Patent application 801,272. Apparatus and Method for Determination of Wavelength. Filed May 27, 1977.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Mgmt. Branch, General Services Division, Federal Bldg., Agricultural Research Service, Hyattsville, Md. 20782

Patent 3,375,252. Conversion of Naringin to Neohesperidin and Neohesperidin Dinhydrochalcone. Mar. 26, 1968. Not available NTIS.

Patent 3,429,873. Preparation of Hesperetin Dihydrochalcone Glucoside. Filed Oct. 14, 1966. Patented Feb. 25, 1969. Not available NTIS.

Patent 3,583,894. Enzyme Preparation of Hesperetin Dihydrochalcone Glucoside. Filed Mar. 29, 1968. Patented June 8, 1971. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, & WELFARE

National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20014

Patent application 742,450. Improved Synthesis of Methotrexate. Filed Nov. 17, 1976.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts., NW.,
Washington, D.C. 20240

Patent application 796,639. Massive Catalyst. Filed May 13, 1977.

Patent 4,005,012. Semipermeable Membranes and the Method for the Preparation Thereof. Filed Sept. 22, 1975. Patented Jan. 25, 1977. Not available NTIS.

Patent 4,009,527. Coordinated Color Chart System, and Method for Producing Same. Filed Nov. 6, 1975. Patented Mar. 1, 1977. Not available NTIS.

Patent 4,010,647. Sampling Method and Apparatus. Filed Dec. 24, 1975. Patented Mar. 8, 1977. Not available NTIS.

Patent 4,022,626. Structural Material. Filed Aug. 22, 1975. Patented May 10, 1977. Not available NTIS.

Patent 4,025,121. High-Pressure Injection Hydraulic Transport System With a Peristaltic Pump Conveyor. Filed Feb. 26, 1976. Patented May 24, 1977. Not available NTIS.

Patent 4,026,786. Preparation of FbO_2 Anode. Filed July 31, 1975. Patented May 31, 1977. Not available NTIS.

Patent 4,026,917. Method of Removing Polynuclear Aromatic Compounds by Adsorption With Coconut Charcal. Filed Feb. 11, 1975. Patented May 31, 1977. Not available NTIS.

Patent 4,026,978. Method of Making Asymmetric Cellulose Triacetate Membranes. Filed July 17, 1975. Patented May 31, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research—Code 302, Arlington, Va. 22217

Patent application 804,036. A Missile System. Filed June 3, 1977.

Patent application 804,041. Correction and Transmission System for Directional Target Information. Filed June 6, 1977.

Patent 4,016,456. Multielectrode Grid for Aligning Polarized Particles Such as Asbestos. Filed Sept. 5, 1975. Patented Apr. 5, 1977. Not available NTIS.

Patent 4,016,796. Weapon Retention Device. Filed Mar. 29, 1976. Patented Apr. 12, 1977. Not available NTIS.

Patent 4,018,636. Soluble Binder for Plastic Bonded Explosives and Propellants. Filed Apr. 20, 1976. Patented Apr. 19, 1977. Not available NTIS.

Patent 4,022,057. Expanding Tool for Nondestructive Inspection of Flexible Wire Rope. Filed July 12, 1976. Patented May 10, 1977. Not available NTIS.

Patent 4,022,130. Ejectable Fuze. Filed Feb. 6, 1976. Patented May 10, 1977. Not available NTIS.

Patent 4,022,405. Fan Lift-Cruise V/STOL Aircraft. Filed Mar. 25, 1976. Patented May 10, 1977. Not available NTIS.

Patent 4,022,422. Stemless Bantam Valve. Filed Feb. 19, 1976. Patented May 10, 1977. Not available NTIS.

Patent 4,023,493. Fireline Detonator. Filed Sept. 24, 1975. Patented May 17, 1977. Not available NTIS.

Patent 4,027,540. Inertial Optical Stabilizer. Filed Mar. 21, 1975. Patented June 7, 1977. Not available NTIS.

Patent 4,027,549. Plug-Type Counterweight and Lock. Filed Oct. 16, 1975. Patented June 7, 1977. Not available NTIS.

Patent 4,028,739. Ventilated Helmet With Selected Weight Distribution. Filed July 2, 1976. Patented June 14, 1977. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Mgmt. Branch,
Agricultural Research Service
Hyattsville, Md. 20782

Patent application 807,273. Wood Cleaning Process and Apparatus. Filed June 16, 1977.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research—Code 302, Arlington, Va. 22217

Patent application 801,446. Remotely Operated X-Y Translation Table. Filed May 27, 1977.

Patent application 801,664. Voltage Level Shifting Device. Filed May 31, 1977.

Patent application 802,707. Chemical Removal of Polymeric Residue With One or More Metals, Salts, and Oxides Mixed Therein. Filed June 2, 1977.

Patent application 806,382. Tokamak Plasma Heating With Intense, Pulsed, Ion Beams. Filed June 14, 1977.

Patent application 808,839. Current-Reducing Device. Filed June 22, 1977.

Patent 4,010,360. Carrier-Compatible Chirp-Z Transform Device. Filed Mar. 31, 1976. Patented Mar. 1, 1977. Not available NTIS.

Patent 4,010,474. Two Dimensional Array Antenna. Filed May 5, 1975. Patented Mar. 1, 1977. Not available NTIS.

Patent 4,012,089. Electronic Equipment Enclosure. Filed Apr. 8, 1974. Patented Mar. 15, 1977. Not available NTIS.

Patent 4,015,252. High Speed Serial Data Synchronization Scheme. Filed June 25, 1975. Patented Mar. 29, 1977. Not available NTIS.

Patent 4,016,547. MOS Shift Register Compensation System for Defective Tracks of Drum Storage System. Filed Jan. 22, 1976. Patented Apr. 5, 1977. Not available NTIS.

Patent 4,017,040. Steerable Extraction Rocket. Filed Jan. 12, 1976. Patented Apr. 12, 1977. Not available NTIS.

Patent 4,017,043. Deployable Rotor. Filed Mar. 8, 1976. Patented Apr. 12, 1977. Not available NTIS.

Patent 4,020,677. Apparatus for Determining Salinity of Fluids. Filed June 17, 1976. Patented May 3, 1977. Not available NTIS.

Patent 4,022,406. Automatically Variable Multistage Parachute. Filed June 23, 1975. Patented May 10, 1977. Not available NTIS.

Patent 4,023,019. Automatic Scaled Digital Integrator. Filed Sept. 23, 1974. Patented May 10, 1977. Not available NTIS.

Patent 4,023,024. Electronic Urn Decision Device. Filed May 19, 1975. Patented May 10, 1977. Not available NTIS.

Patent 4,023,028. Method and Apparatus for Computing the Discrete Fourier Transform Recursively. Filed Aug. 20, 1974. Patented May 10, 1977. Not available NTIS.

Patent 4,023,117. Stimulated Raman Scattering Resonator. Filed Feb. 3, 1976. Patented May 10, 1977. Not available NTIS.

Patent 4,023,123. Microstrip Reverse-Phased Hybrid Ring Coupler. Filed Feb. 3, 1975. Patented May 10, 1977. Not available NTIS.

Patent 4,023,906. Compact Three-Beam Interferometer. Filed June 11, 1976. Patented May 17, 1977. Not available NTIS.

Patent 4,023,909. Null Balance Alphameter. Filed Jan. 15, 1976. Patented May 17, 1977. Not available NTIS.

Patent 4,025,145. Repairable Shielded Cable Connector. Filed May 17, 1975. Patented May 24, 1977. Not available NTIS.

Patent 4,025,873. Broadband, Microwave, Two-Stage, Stagger-Tuned, Field Effect Transistor Amplifier. Filed Aug. 17, 1976. Patented May 24, 1977. Not available NTIS.

Patent 4,027,946. Acousto-Optic Guided-Light Beam Device. Filed Sept. 24, 1975. Patented June 7, 1977. Not available NTIS.

Patent 4,028,565. Semiconductor Visible Image Storage Device. Filed June 27, 1975. Patented June 7, 1977. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent 4,026,527. Vortex Generator for Controlling the Dispersion of Effluents in a Flowing Liquid. Patented May 31, 1977. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Mgmt. Branch, General Services Division, Federal Bldg., Agricultural Research Service, Hyattsville, Md. 20782

Patent application 766,771. N-(3-Alkylamidopropyl)-N,N-Dimethyl-N -(p-Sulfobenzyl) Ammonium Inner Salts. Filed May 13, 1977.

Patent 4,031,019. Alcohol Esters of Fatty Acids as Useful Metalworking Lubricants. Filed Oct. 3, 1975. Patented June 21, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research—Code 302, Arlington, Va. 22217

Patent application 751,638. Ignition Device for Missile Motors. Filed Dec. 17, 1976.

Patent application 785,974. A Frequency-Agile Fire-Control Radar System. Filed Apr. 8, 1977.

Patent application 788,371. Analog Sound Velocity Calculator. Filed Apr. 18, 1977.

Patent application 791,458. Parametric Energy Coupled Uninterruptible Power Supply. Filed Apr. 27, 1977.

Patent application 797,207. Compensation for Simultaneous Platform Motion and Antenna Scanning in MTI Radars. Filed May 16, 1977.

Patent application 797,209. Motion-Compensation Arrangements for MTI Radars. Filed May 16, 1977.

Patent application 797,726. Flip Chip Fiber Film Coupler. Filed May 17, 1977.

Patent application 798,289. Programmable Charge Coupled Device Timing System. Filed May 19, 1977.

Patent application 799,103. Fabrication of Atmospheric-Tarnish-Free Cooper Metal Mirrors for High-Power Laser Applications. Filed May 24, 1977.

Patent application 801,180. A Mass Transport Heat Exchanger Method and Apparatus for Use in Ocean Thermal Energy Exchange Power Plants. Filed May 27, 1977.

Patent 4,009,380. Electro-Optical System for Performing Matrix-Vector Multiplication. Filed Jan. 20, 1975. Patented Feb. 22, 1977. Not available NTIS.

Patent 4,017,043. Deployable Rotor. Filed Mar. 8, 1976. Patented Apr. 12, 1977. Not available NTIS.

Patent 4,017,809. Multi-Frequency Oscillator Circuit. Filed July 25, 1975. Patented Apr. 12, 1977. Not available NTIS.

Patent 4,017,836. Event Stacker and Display Device. Filed Apr. 5, 1976. Patented Apr. 12, 1977. Not available NTIS.

Patent 4,025,913. Electrical Field Sensing and Transmitting Apparatus. Filed Dec. 22, 1975. Patented May 24, 1977. Not available NTIS.

Patent 4,026,213. Selectively Aimable Warhead. Filed June 17, 1971. Patented May 31, 1977. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

Patent application 680,015. Determination of Antimicrobial Susceptibilities of Infected Urines Without Isolation. Filed Apr. 23, 1976.

Patent application 796,258. A Cervix-to-Rectum Measuring Device in a Radiation Applicator for Use in the Treatment of Cervical Cancer. Filed May 12, 1977.

Patent application 799,024. Composite Sandwich Lattice Structure. Filed May 20, 1977.

Patent application 807,762. Boron Trifluoride Coatings for Thermoplastic Materials. Filed June 17, 1977.

Patent 3,849,720. Electro-Mechanical Sine/Cosine Generator. Patented Nov. 19, 1974. Not available NTIS.

Patent 4,023,266. Process for Preparing Liquid Metal Electrical Contact Device. Patented May 17, 1977. Not available NTIS.

Patent 4,025,783. Gregorian All-Reflective Optical System. Patented May 24, 1977. Not available NTIS.

Patent 4,025,876. Distributed Feedback Acoustic Surface Wave Oscillator. Patented May 24, 1977. Not available NTIS.

Patent 4,026,527. Vortex Generator for Controlling the Dispersion of Effluents in a Flowing Liquid. Patented May 31, 1977. Not available NTIS.

Patent 4,027,212. Three Phase Full Wave DC Motor Decoder. Patented May 31, 1977. Not available NTIS.

Patent 4,031,389. Isotope Separation Using Metallic Vapor Lasers. Patented June 21, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE ARMY
Office of Judge Advocate General, Patent Division, Room 2C–455, Pentagon, Washington, D.C. 20314

Patent 4,004,175. High Voltage Particle Accelerator Utilizing Polycrystalline Ferroelectric Ceramic Material. Filed Dec. 9, 1975. Patented Jan. 18, 1977. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Mgmt. Branch, General Services Division, Federal Bldg., Agricultural Research Service, Hyattsville, Md. 20782

Patent application 785,615. Shrinkproofing of Fabrics. Filed Apr. 7, 1977.

U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 646,782. Regenerable Sorbent and Method for Removing Hydrogen Sulfide From Hot Gaseous Mixtures. Filed Mar. 1, 1976.

Patent application 652,695. Method for Preparing Single Crystal Lab Sub 6 Cathodes. Filed Jan. 27, 1976.

Patent application 652,696. Method of Preparing Porous, Active Material for Use in Electrodes of Secondary Electrochemical Cells. Filed Jan. 27, 1976.

Patent application 657,525. Compartmented Electrodes Structure. Filed Feb. 12, 1976.

Patent application 675,086. Nuclear Waste Solidification. Filed Apr. 8, 1976.

Patent application 683,156. Method for Isotope Enrichment by Photoinduced Chemiionization. Filed May 4, 1976.

Patent application 690,498. Variable Displacement Internal Combustion Engine. Filed May 27, 1976.

Patent application 696,997. Isotope Separation by Photoselective Dissociative Electron Capture. Filed June 17, 1976.

Patent 3,959,094. Electrolytic Synthesis of Methanol From CO Sub. 2. Filed Mar. 13, 1975. Patented May 25, 1976. Not available NTIS.

Patent 3,960,138. Differential Temperature Integrating Diagnostic Method and Apparatus. Filed Jan. 6, 1975. Patented June 1, 1976. Not available NTIS.

Patent 3,969,123. Refractory Ceramic Compositions and Method for Preparing Same. Filed Feb. 11, 1975. Patented July 13, 1976. Not available NTIS.

Patent 3,969,160. High-Strength Ductile Uranium Alloy. Filed June 3, 1975. Patented July 13, 1976. Not available NTIS.

Patent 3,969,495. Thermochemical Production of Hydrogen. Filed June 26, 1975. Patented July 13, 1976. Not available NTIS.

Patent 3,969,631. Gas Production Apparatus. Filed Mar. 20, 1975. Patented July 13, 1976. Not available NTIS.

Patent 3,970,450. Modified Iridium-Tungsten Alloy. Filed July 16, 1975. Patented July 20, 1976. Not available NTIS.

Patent 3,976,898. Prestressed Glass, Aezoelectric Electrical Power Source. Filed Mar. 20, 1975. Patented Aug. 24, 1976. Not available NTIS.

Patent 3,979,209. Ductile Tungsten-Nickel Alloy and Method for Making Same. Filed Feb. 18, 1975. Patented Sept. 7, 1976. Not available NTIS.

Patent 3,979,234. Process for Fabricating Articles of Tungsten-Nickel-Iron Alloy. Filed Sept. 18, 1975. Patented Sept. 7, 1976. Not available NTIS.

Patent 3,980,495. Calcium Alloy as Active Material in Secondary Electrochemical Cell. Patented Dec. 14, 1976. Not available NTIS.

Patent 3,980,916. Beam Limiter for Thermonuclear Fusion Devices. Filed July 22, 1975. Patented Sept. 14, 1976. Not available NTIS.

Patent 3,983,392. Method and Apparatus for Measuring Incombustible Content of Coal Mine Dust Using Gamma Ray Backscatter. Filed Feb. 14, 1975. Patented Sept. 28, 1976. Not available NTIS.

Patent 3,985,078. Power Supply. Filed Sept. 11, 1975. Patented Oct. 12, 1976. Not available NTIS.

Patent 3,985,551. Process for Removing Carbon From Uranium. Filed Feb. 24, 1976. Patented Oct. 12, 1976. Not available NTIS.

Patent 3,985,595. Insensitive Explosive Composition of Halogenated Copolymer and Triaminotrinitrobenzene. Filed Nov. 29, 1974. Patented Oct. 12, 1976. Not available NTIS.

Patent 3,987,145. Ferric Ion as a Scavenging Agent in a Solvent Extraction Process. Filed May 15, 1975. Patented Oct. 19, 1976. Not available NTIS.

Patent 3,987,302. Resonance Ionization for Analytical Spectroscopy. Filed Aug. 27, 1975. Patented Oct. 19, 1976. Not available NTIS.

Patent 3,988,123. Gasification of Carbonaceous Solids. Filed Aug. 15, 1975. Patented Oct. 26, 1976. Not available NTIS.

Patent 3,988,919. Use of Graphitized Carbon Beads for Gas Liquid Chromatography. Filed Oct. 7, 1975. Patented Nov. 2, 1976. Not available NTIS.

Patent 3,989,608. Flotation Process for Removal of Precipitates From Electrochemical Chromate Reduction Unit. Filed Dec. 30, 1975. Patented Nov. 2, 1976. Not available NTIS.

Patent 3,989,808. Method of Preparing Pure Fluorine Gas. Filed July 28, 1975. Patented Nov. 2, 1976. Not available NTIS.

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Patent application 783,100. Laser Tuning With an Acousto-Optic Lens. Filed Mar. 31, 1977.

Patent application 784,020. An Elastic Electrically-Conductive Strain Cable. Filed Apr. 4, 1977.

Patent application 785,976. Four-Dimensional Isometric Radar Target Image Display. Filed Apr. 8, 1977.

Patent application 788,874. Tapped Surface Acoustic Wave Delay Line. Filed Apr. 19, 1977.

Patent application 789,161. Retroreflectance Measurement System. Filed Apr. 20, 1977.

Patent application 790,105. Automated Fire-Inerting System. Filed Apr. 22, 1977.

Patent application 790,623. Air Revitalization Compositions. Filed Apr. 25, 1977.

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Patent 3,928,108. Method of Making a Poly(Methyl Methacrylate) Pre-Holographic Element. Filed Aug. 12, 1974. Patented Dec. 23, 1975. Not available NTIS.

Patent 3,981,592. System for Locating Breaks in Fiber Optic Filaments. Filed Mar. 31, 1975. Patented Sept. 21, 1976. Not available NTIS.

Patent 3,984,266. Process for Bonding a Ferro-Cement Structure With Fiberglass Reinforced Plastic. Filed Apr. 22, 1974. Patented Oct. 5, 1976. Not available NTIS.

Patent 3,993,631. Polyphthalocyanines Prepared From N,N Bis(3,4-Dicyanophenyl) Alkanediamides. Filed Aug. 23, 1974. Patented Nov. 23, 1976. Not available NTIS.

Patent 4,002,504. Multifilament Superconductors. Filed Dec. 23, 1975. Patented Jan. 11, 1977. Not available NTIS.

Patent 4,005,376. Electronically Variable Surface Acoustic Wave Phase Shifter. Filed Apr. 15, 1976. Patented Jan. 25, 1977. Not available NTIS.

Patent 4,006,412. Digital Display System Circuit. Filed Oct. 29, 1974. Patented Feb. 1, 1977. Not available NTIS.

Patent 4,008,470. Passive Ranging System. Filed Feb. 27, 1968. Patented Feb. 15, 1977. Not available NTIS.

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Patent 4,013,245. Homing Projectile. Filed Dec. 5, 1975. Patented Mar. 22, 1977. Not available NTIS.

Patent 4,015,621. Pressure Control and Fluid Venting System for a Pressurized Container. Filed Mar. 18, 1976. Patented Apr. 5, 1977. Not available NTIS.

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Patent 4,016,764. Temperature Compensated, High Resolution Pressure Transducer Based on Capacitance Change Principles. Filed July 19, 1976. Patented Apr. 12, 1977. Not available NTIS.

Patent 4,018,911. Method for Large Volume Freezing and Thawing of Packed Erythrocytes. Filed Nov. 10, 1975. Patented Apr. 19, 1977. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

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Patent 4,017,959. Method of Forming Shrink-Fit Compression Seal. Patented Apr. 19, 1977. Not available NTIS.

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U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

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Patent application 771,858. Method for the Preparation of Bis (Perfluoro-T-Butyl) Peroxide. Filed Feb. 23, 1977.

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Patent 4,010,463. Phase Locked Loop Resolver to Digital Converter. Filed Apr. 21, 1975. Patented Mar. 1, 1977. Not available NTIS.

Patent 4,011,117. Method for Curing Poly(Glycidyl 2,2-Dinitro-2-Ethoxide). Filed May 23, 1974. Patented Mar. 8, 1977. Not available NTIS.

Patent 4,011,255. Fluoroalkyleneether Difunctional Compounds. Filed Sept. 4, 1975. Patented Mar. 8, 1977. Not available NTIS.

Patent 4,011,267. Perfluoroalkylether Substituted Aryl Phosphines and Their Synthesis. Filed Nov. 6, 1975. Patented Mar. 8, 1977. Not available NTIS.

Patent 4,011,306. Oxygen Generation Method. Filed Feb. 26, 1976. Patented Mar. 8, 1977. Not available NTIS.

Patent 4,011,471. Surface Potential Stabilizing Circuit for Charge-Coupled Devices Radiation Hardening. Filed Nov. 18, 1975. Patented Mar. 8, 1977. Not available NTIS.

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Patent 4,015,710. Reusable Shipping Container Assembly. Filed Oct. 17, 1975. Patented Apr. 5, 1977. Not available NTIS.

Patent 4,015,880. Multiple Level Fluid Bearing Track Assembly. Filed May 21, 1975. Patented Apr. 5, 1977. Not available NTIS.

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Patent 4,016,322. Ablative Protective Material for Reentry Bodies. Filed Sept. 12, 1975. Patented Apr. 5, 1977. Not available NTIS.

U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
Assistant General Counsel for Patents
Washington, D.C. 20545

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20014

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Patent application 790,988. Activity Monitor for Ambulatory Subjects. Filed Apr. 26, 1977.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research—Code 302, Arlington, Va. 22217

Patent application 642,878. Sealing of Glass Ampoules. Filed Dec. 22, 1975.

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Patent application 711,944. Headgear Suspension System. Filed Aug. 5, 1976.

Patent application 720,851. Lead-In-Paint Indicator Gel. Filed Sept. 7, 1976.

Patent application 727,504. Container Lift Coupling. Filed Sept. 28, 1976.

Patent application 763,271. Ocean Adapted Airship. Filed Jan. 27, 1977.

Patent application 767,606. A Non-Explosive Lithium Battery. Filed Feb. 10, 1977.

Patent application 770,872. Aircraft to Weapon Fuze Communication Link. Filed Feb. 22, 1977.

Patent application 772,704. Anisotropic Sheet Metal. Filed Feb. 28, 1977.

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Patent 3,946,322. Pulse Duty Cycle Transition Moderating Device. Filed June 17, 1974. Patented Mar. 23, 1976. Not available NTIS.

Patent 3,958,597. Throttle Control for Remote Air Driven Devices. Filed Oct. 21, 1974. Patented May 25, 1976. Not available NTIS.

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Patent 4,002,061. Capacitance Transducer for the Measurement of Bending Strains at Elevated Temperatures. Filed Apr. 30, 1976. Patented Jan. 11, 1977. Not available NTIS.

Patent 4,007,633. Method of Determining the Physical Characteristics of a Sea Floor. Filed Oct. 14, 1975. Patented Feb. 15, 1977. Not available NTIS.

Patent 4,008,427. Variable Input Power Supply. Filed Sept. 29, 1975. Patented Feb. 15, 1977. Not available NTIS.

Patent 4,008,606. Ship's Bottom Inspection Apparatus. Filed Oct. 20, 1975. Patented Feb. 22, 1977. Not available NTIS.

Patent 4,009,452. Submersible Power Package. Filed Jan. 12, 1976. Patented Feb. 22, 1977. Not available NTIS.

Patent 4,009,828. Organic Nucleating Agent for Both Warm and Cold Clouds. Filed Nov. 19 1975. Patented Mar. 1, 1977. Not available NTIS.

Patent 4,010,619. Remote Unmanned Work System (RUWS) Electromechanical Cable Systems. Filed May 24, 1976. Patented Mar. 8, 1977. Not available NTIS.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

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Patent application 760,057. Safety Flywheel. Filed Jan. 17, 1977.

Patent application 790,637. Method for Producing Solar Energy Panels by Automation. Filed Apr. 25, 1977.

Patent application 796,256. Induction Powered Biological Radiosonde. Filed May 12, 1977.

Patent 3,478,514. Hydraulic Drain Means for Servo-Systems. Patented Nov. 18, 1969. Not available NTIS.

Patent 3,736,453. Arc Control in Compact Arc Lamps. Patented May 29, 1973. Not available NTIS.

Patent 3,896,955. Automated Multi-Level Vehicle Parking System. Patented July 29, 1975. Not available NTIS.

Patent 4,014,745. Application of Luciferase Assay for ATP to Antimicrobial Drug Susceptibility. Patented Mar. 29, 1977. Not available NTIS.

Patent 4,018,532. Sun Direction Detection System. Patented Apr. 19, 1977. Not available NTIS.

Patent 4,018,971. Gels as Battery Separators for Soluble Electrode Cells. Patented Apr. 19, 1977. Not available NTIS.

Patent 4,019,868. Solar Hydrogen Generator. Patented Apr. 26, 1977. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 3, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-3-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-21-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	2-7-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	12-6-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-3-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	8-18-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	7-8-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-24-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-5-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-3-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-6-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-15-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	4-1-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	11-8-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	12-2-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	4-1-77

Expiration of patents: The patents within the range of numbers indicated below expire during December 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,962,719 to 2,966,680, inclusive
Plant Patents..... Numbers 1,991 to 2,008, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED JANUARY 3, 1978

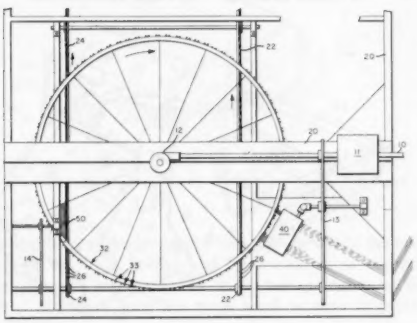
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T966,001
APPARATUS AND METHOD FOR MULTIPLE STRAND WEB FORMATION

George Daniel Forsythe, Landenberg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 696,749, June 16, 1976, abandoned.
This application May 25, 1977, Ser. No. 800,431
Int. Cl.² D04H *3/04*
U.S. Cl. 28—100
7 Sheets Drawing. 14 Pages Specification

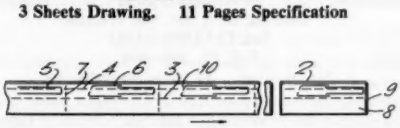


A method for traversing a plurality of strands between two spaced rows of strand-restraining elements moving together in the same direction in substantially the same plane to form a web is implemented by a plurality of strand transfer members moving in a single closed path spanning the rows of strand-restraining elements so that the members pass between strand-restraining elements on one of the rows and above them on the other row. There is a means provided for moving each strand back and forth across the path into engagement with the strand transfer members and a means for disengaging each strand from each strand transfer member beyond the other row and depositing it as a loop around at least one of the strand-restraining elements.

T966,002
PLASTICS BAGS PRODUCTION

John Grover Barnes, Brampton, and Charles Robertson Murray, Toronto, both of Canada, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 18, 1977, Ser. No. 778,926
Claims priority, application United Kingdom, Mar. 23, 1976, 11632/76
Int. Cl.² B31B *1/84*
U.S. Cl. 93—8 VB
3 Sheets Drawing. 11 Pages Specification



In the production of plastics bags, especially valved bags, from a web of plastics material by folding in the side margins of the web to form overlapping panels which are then longitudinally heat-sealed together for a major portion of one bag length, and then heat-sealing the web transversely and severing the web at intervals to produce individual bags, the two overlapping panels are heat-sealed together by forming two longitudinal seals which partially overlap to provide a forward longitudinal seal and a rear longitudinal seal with respect to the direction of travel of the web, the rear longitudinal seal of each bag being formed simultaneously with the forward longitudinal seal of the adjacent following bag. The apparatus comprises a pair of heat-sealing elements equipped for simultaneous operation and arranged for forming the rear seal in one bag and the forward seal in the following adjacent bag. The two elements may be a fixed distance apart, and at least one has suitably a hairpin shape.

T966,003
PHOTOGRAPHIC ELEMENTS CONTAINING VAPOR DEPOSITED SILVER HALIDE LAYERS

Joe E. Maskasky, c/o Kodak Park Division, Rochester, N.Y. 14650

Filed Feb. 7, 1977, Ser. No. 766,290
Int. Cl.² G03C *1/02*
U.S. Cl. 96—94 BF
No Drawing. 15 Pages Specification

A photographic element is disclosed comprised of a support and at least two contiguous vacuum vapor deposited silver halide layers. One of the layers is a vacuum vapor deposited silver iodide layer. A second, contiguous layer is a vacuum vapor deposited silver chloride layer.

T966,004
METHOD OF COOLING A FAST-BREEDER REACTOR

Mario D. Carelli, Greensburg, and Christopher W. Bach, North Huntingdon Township, Westmoreland County, both of Pa., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

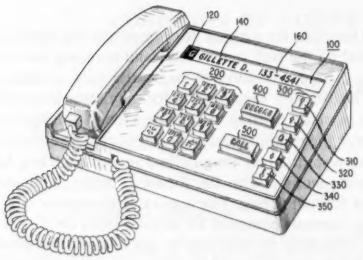
Continuation of Ser. No. 699,392, June 24, 1976, abandoned.
This application Apr. 20, 1977, Ser. No. 789,315
Int. Cl.² G21C *1/02*
U.S. Cl. 176—40
1 Sheets Drawing. 14 Pages Specification

Operation of a liquid-metal-cooled fast-breeder reactor is enhanced by distributing coolant among the fuel assemblies at such a rate that the strain equivalent limiting temperature of each fuel assembly is closely approached but not exceeded. Further improvement is attained by proportionally allocating less coolant of a total prescribed coolant flow to the outer fuel assemblies of the reactor (yet satisfying the condition that the strain equivalent limiting temperature is not exceeded) whereby additional coolant flow is available for the inner fuel assemblies, thereby further reducing the radial thermal gradient in the coolant immediately above the fuel assemblies, a particular advantage being that the temperature of the upper internal structure of the reactor immediately above the inner zone of the reactor is reduced.

T966,005
REPERTORY DIALER

Dean Gillette, Rumson, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed July 5, 1977, Ser. No. 812,770
Int. Cl.[2] H04M *1/51*
U.S. Cl. 179—90 B
1 Sheets Drawing. 6 Pages Specification



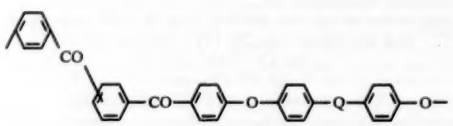
A repertory dialer is disclosed that includes a solid state display and a telephone keyboard coupled to a solid state memory. The solid state display comprises a plurality of alphanumeric characters, the first of which is used to provide an alphabetical index. The rest of the characters are divided into a name display and a telephone number display. The telephone keyboard is used to generate alphabetic and numeric inputs to the memory. A five-button scanning control causes the alphanumeric information stored in the memory to be sequentially displayed. Scanning is achieved by the operation of either a fast forward button, a slow forward button, a stop button, a slow backward button, or a fast backward button. Record and call function select buttons are used to select either the record or call modes of operation.

T966,006
AROMATIC POLYMERS

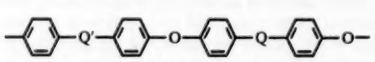
John Leslie Freeman, St. Neots, and John Brewster Rose, Letchworth, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 10, 1977, Ser. No. 767,332
Claims priority, application United Kingdom, Feb. 10, 1975, 5173/75
Int. Cl.[2] C08G *65/40*
U.S. Cl. 260—49
No Drawing. 26 Pages Specification

Aromatic polymers having phenylene groups linked by oxygen atoms, ketone groups and sulphone groups, that is ether-ketone/sulphone copolymers, containing 40 to 90 and preferably 50 to 80, mole % of the repeat units



and correspondingly **10** to **60**, particularly **20** to **50**, mole % of repeat units



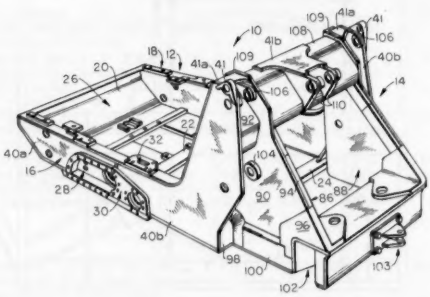
where Q and Q' are $-SO_2-$ or —CO—, the number of $-SO_2-$ groups being **3** to **25**% of the total number of $-SO_2-$ and —CO— groups are disclosed. Such copolymers are made more cheaply than the similar copolymers of U.K. Pat. No. **1,414,422** yet exhibit improved properties of a somewhat reduced melting point, owning to the incorporation of sulphone linkages in the polymer chain, thus providing greater latitude over processing temperatures. Preferably from **10** to **20**% of the total sulphone and ketone linkages in the copolymers are sulphone linkages. The disclosed copolymers are particularly suitable for wire insulation where the polymer has to retain its properties at high service temperatures.

In practice the copolymers have a reduced viscosity of at least 0.8, preferably 1.0, and a low absorbence, such as below 0.35, indicating relative freedom from structural irregularities such as chain branching, both parameters measured according to the procedures disclosed.

T966,007
MAIN FRAME FOR A LOADER VEHICLE

Douglas P. Liehr, Bettendorf, and Robert A. Sutton, Davenport, both of Iowa, assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed July 7, 1977, Ser. No. 813,726
Int. Cl.[2] B62D *27/00*
U.S. Cl. 296—28 R
3 Sheets Drawing. 10 Pages Specification



An integral welded main frame for a loader vehicle having a hydrostatic drive system, including a front frame section for supporting a load forwardly thereof, a pair of rails extending rearwardly from the front frame section, each of the rails including an upper plate and a lower plate joined by an outer plate and an inner plate to form a box section, the inner plate having an opening for receiving a hydraulic motor of the system, a first casing for a final drive of the system, including a first curved plate surrounding the final drive and the opening and extending from the inner plate to outside the outer plate, whereby each rail is reinforced in the area of the opening, a second casing for a pivot bar extendable through one of the rails, including a second curved plate welded to the outer plate and extending outside thereof, whereby each of the rails is reinforced in the area of the pivot bar, and a plurality of cross-members connecting the pair of side rails.

T966,008
OXIDATION OF p-XYLENE TO TEREPHTHALALDEHYDE

James E. Williams, 139 Deadrick St., Kingsport, Tenn. 37663

Continuation of Ser. No. 611,380, Sept. 8, 1975. This application Dec. 20, 1976, Ser. No. 752,230
Int. Cl.[2] C07C *45/02*
U.S. Cl. 260—599
No Drawing. 11 Pages Specification

Terephthalaldehyde is produced by the vapor phase oxidation of p-xylene in the presence of a catalyst mixture of tungsten in the form of an oxide or silicotungstic acid, molybdenum in the form of an oxide and bismuth in the form of an oxide, wherein the activity of the catalyst is prolonged by contacting the catalyst mixture intermittently or continuously with molybde-

num oxide vapor or a compound which forms molybdenum oxide under the reaction conditions.

T966,009

STATIC FREE FLUID BEARING TRACK SYSTEM

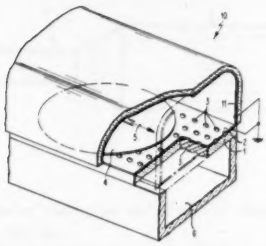
Bayard G. Gardineer, Jr., Patterson; Stanley A. Manning, Yorktown Heights; Arthur E. Meeks, Woodstock, and Bela Musits, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 676,600, April 13, 1976, abandoned. This application May 24, 1977, Ser. No. 800,151

Int. Cl.[2] B65G *51/02*

U.S. Cl. 302—2 R

1 Sheets Drawing. 8 Pages Specification



An improved fluid bearing track structure in which the metal surface of the track is enclosed by a transparent envelope having the inner surface coated with a transparent metal film which is grounded with the metal track surface to prevent static buildup.

T966,010

CAPACITIVE VOLTAGE TRANSFORMER WITH IMPROVED COMPENSATING REACTOR ARRANGEMENT

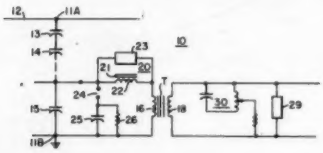
Andrew S. Sweetana, Jr.; Gerald B. Boyette, both of Bloomington, and Frederick J. Brown, Ellettsville, all of Ind., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 631,296, Nov. 12, 1975, abandoned. This application Apr. 7, 1977, Ser. No. 785,381

Int. Cl.[2] G05F *3/06*

U.S. Cl. 323—61

1 Sheets Drawing. 12 Pages Specification



A compensating reactor in a coupling capacitor potential device including a magnetic core with an inductive winding, the reactor providing inductive reactance cancelling capacitive reactance of the device, and a voltage limiting device connected across the compensating reactor which is a ceramic oxide non linear resistor. The reactor core can be a magnetic steel whose normal saturation level substantially exceeds the voltage at which the voltage limiter changes resistance.

T966,011

PATTERN-RECOGNITION SYSTEM AND METHOD

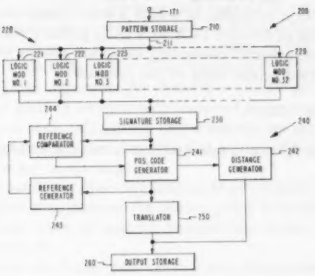
Philip H. Howard, Rochester, Mich., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 95,676, Dec. 7, 1970, abandoned. This application June 20, 1977, Ser. No. 808,211

Int. Cl.[2] G06K *9/00*

U.S. Cl. 340—146.3 AC

6 Sheets Drawing. 63 Pages Specification



A plurality of binary logic trees converts a pattern to a signature word. Each logic has addressable test-node words with branch, status and pattern-bit address fields. The status field has flags for indicating a desired value of a pattern bit and for identifying leaf-node logic words for setting the signature bits. The logics are interrelated to each other by a set of reference words having a substantially constant intrapair Hamming distance. The signature is converted to one or more identifying codes by generating one of the reference words from the signature and comparing it with the signature. If one code is used, the comparison gives the correct code for the pattern. For plural codes, the codes are checked for consistency with each other and are used to complete a correct identifying code. Computer-program implementations are described for accomplishing all the above functions.

T966,012

WOVEN ELASTIC FABRIC AND PROCESS FOR MAKING

Alexis Reicher, 12, Rue Albert Gros, 1206 Geneva, Switzerland

Filed Feb. 14, 1977, Ser. No. 768,614

Int. Cl.[2] D03D *15/00*

U.S. Cl. 428—259

1 Sheets Drawing. 10 Pages Specification

A slip-resistant woven elastic fabric is made of hard weft yarns and paired fusible elastomer leno warp yarns, the individual warp yarns of each pair crossing and recrossing each other at intervals throughout the fabric and being fused to each other at the crossover points.

T966,013

TRANSITION METAL COMPOUND

Alan Branford Newton, Welwyn Garden City, and John Edward Priddle, Welwyn, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 3, 1976, Ser. No. 747,383

Claims priority, application United Kingdom, Jan. 2, 1976, 68/76

Int. Cl.[2] C08F *4/66, 10/06*

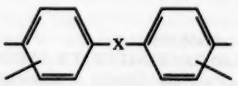
U.S. Cl. 526—140

No Drawing. 41 Pages Specification

A process is provided in which a solid compound of a transition metal of Groups IVA to VIA is ground with at least one polymeric material containing sulphone groups and containing at least two repeat units of the formula:

$$-Ar-SO_2-$$

in which Ar is a bivalent aromatic radical and may vary from unit to unit in the polymer chain. The Ar radical preferably contains two aromatic rings linked together, as in:



where X is an O or S atom, a direct link or the residue obtained by removing H from each —OH group present in an aromatic diol. If Ar varies the material is a copolymer. The polymeric material can be a polyethersulphone.

The transition metal can be zirconium, vanadium or titanium. Preferably the transition metal compound is a halide such as titanium trichloride.

REISSUES

JANUARY 3, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

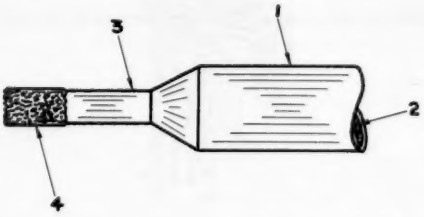
Re. 29,506
METHOD OF SEALING THE END OF A FILLED WELDING ROD

Richard W. Young, LaHabra, and Sidney A. Siebert, Fullerton, both of Calif., assignors to Cabot Corporation, Kokomo, Ind.

Original No. 3,894,211, dated July 8, 1975, Ser. No. 468,806, May 10, 1974. Application for reissue Dec. 4, 1975, Ser. No. 637,567

Int. Cl.[2] B22D *11/126*

U.S. Cl. 29—527.4 **9 Claims**



9. The method of closing an end of a filled tube welding rod comprising the steps of:

a. reducing the transverse cross-sectional area of the end of the filled tube welding rod, and

b. subsequently, applying to said reduced end to seal the said reduced end a solid organic film volatilizable at welding temperature to provide a contaminant-free weldment, said organic film comprising pyroxylin and alcohol.

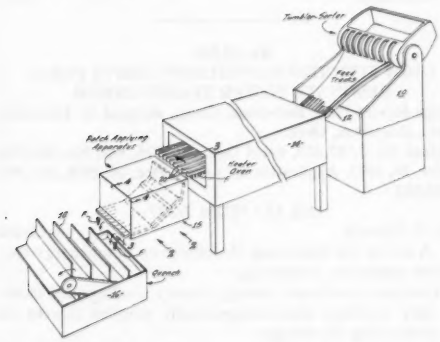
Re. 29,507
APPARATUS FOR FORMING SELF LOCKING FASTENERS

Otto Kurt Schwenzfeier, Chula Vista, Calif., assignor to Long-Lok Fasteners Corporation, Cincinnati, Ohio

Original No. 3,726,740, dated Apr. 10, 1973, Ser. No. 141,654, May 10, 1971. Application for reissue Aug. 29, 1973, Ser. No. 392,611

Int. Cl.[2] B32B *31/00*

U.S. Cl. 156—498 **35 Claims**



1. [In an apparatus for forming a plastic patch on a workpiece having a curved cross-section configuration, for example, on the screw thread of a fastener, the combination of:

means to place a workpiece in preselected position at a processing station;

means to advance an increment of plastic strip to a position above the workpiece;

means to shear off a fragment from the increment and to carry the fragment to the workpiece, and

means having a curved working face shaped to a curvature that is substantially complementary to the curvature of the workpiece to press the sheared fragment of plastic strip against the curved surface of the workpiece for adherence thereto.] *An apparatus for forming a plastic patch on a workpiece which is an externally threaded fastener to provide the fastener with self-locking characteristics by reason of a patch of plastic adhered to a plurality of unmodified threads of the fastener comprising:*

means for heating the threaded fastener to an elevated temperature sufficient to convert the plastic patch to a completely molten state when the patch is brought into contact with the heated fastener;

means to place the heated fastener in a preselected position at a processing station;

means to advance an increment of plastic strip to a position adjacent the heated fastener;

means for cutting a fragment from the increment and to carry the fragment to the heated fastener;

means having a smooth working face which is shaped to a curvature that is substantially complementary to the curvature of the threaded fastener to press the fragment of plastic strip about the fastener and into engagement with the crests of the threads of the heated fastener, and

means to yieldingly move said means having a smooth working face against said heated fastener with a force which applied a work shaping pressure to the fragment that is sufficient to hold the fragment engaged with the crests of the threads of the heated fastener without pressurally forcing material of the fragment into the valleys of the threads for a time sufficient for the heated crests of the fastener to sever the fragment into discrete segments which in a completely molten state flow downwardly of the crests and into the valleys between adjacent crests of the threads to adhere to adjacent flanks of the threads in forming a unitary plastic patch on the threads in which accurately predetermined quantities of the plastic are present in each of the discrete severed segments of the plastic patch.

Re. 29,508
RING-SUBSTITUTED N-(2,2-DIFLUOROALKANOYL)-o-PHENYLENEDIAMINE COMPOUNDS

George O. P. O'Doherty, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

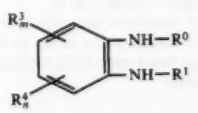
Original No. 3,907,892, dated Sept. 23, 1975, Ser. No. 479,073, June 13, 1974. Continuation-in-part of Ser. No. 277,452, Aug. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 47,857, June 19, 1970, abandoned, and Ser. No. 17,865, March 9, 1970, abandoned, which is a continuation-in-part of Ser. No. 803,998, March 3, 1969, abandoned. Application for reissue Dec. 13, 1976, Ser. No. 750,306

Int. Cl.[2] C07C *103/20*

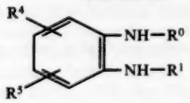
U.S. Cl. 260—562 B **10 Claims**

1. A compound selected from the group consisting of the compounds of the formulae:

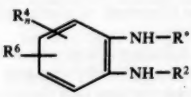
I.



-continued



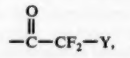
II.



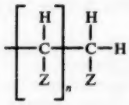
III.

wherein

R^0 represents a 2,2-difluoroalkanoyl radical of the formula

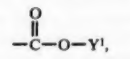


wherein Y represents hydrogen, chlorine, fluorine, difluoromethyl, perfluoroalkyl of C_1–C_6, or radical of the formula

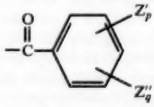


wherein each Z independently represents hydrogen or halogen and n represents 0 or 1;

R^1 represents hydrogen radical of the formula



wherein Y represents loweralkyl of C_1–C_4 or phenyl, benzoyl furoyl, naphthoyl, or substituted benzoyl of the formula



wherein each Z′ independently represents halo or nitro, Z″ represents loweralkyl of C_1–C_4 or loweralkoxy of C_1–C_4, p represents 0, 1, or 2, q represents 0 or 1, and the sum of p and q is 1–3;

R^2 represents R^0, R^1, alkanoyl of C_1–C_8, loweralkenoyl of C_3–C_4, loweralkynoyl of C_3–C_4, halogenated loweralkanoyl of C_2–C_4 bearing on any position or positions one or more halogen atoms, each independently selected, subject to the limitation that the alpha position bear at least one substituent moiety selected from the group consisting of hydrogen and halogen of atomic weight from 35 to 127, both inclusive;

each R^3 independently represents halogen;

R^4 represents nitro;

R^5 represents trifluoromethyl, difluoromethyl, or difluorochloromethyl, and in compounds of Formula II, R^4 and R^5 are meta to one another;

R^6 represents loweralkylsulfonyl of C_1–C_4 and is located at the 4 or 5 position, and any R^4 group is meta to R^6;

m represents 0–4;

n represents 0–1; and in compounds of Formula I, the sum of m and n is an integer of from 1 to 4;

subject to the further limitation that where R^1 or R^2 represents hydrogen, the ring position ortho to the —NH—R^1 or —NH—R^2 group bears one of the designated R^3, R^4, *or* R^5[, or R^6] moieties.

Re. 29,509

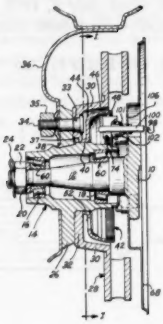
WHEEL SPEED SENSOR FOR AN ADAPTIVE BRAKING SYSTEM

Edward M. Pauwels; David D. Jordan, both of South Bend, Ind., and Ward C. Suttle, Tucson, Ariz., assignors to The Bendix Corporation, South Bend, Ind.

Original No. 3,626,226, dated Dec. 7, 1971, Ser. No. 42,168, June 1, 1970. Application for reissue Dec. 3, 1973, Ser. No. 421,385

Int. Cl.² H02K *19/24*

U.S. Cl. 310—168 **3 Claims**



2. A wheel speed sensor comprising:

a spindle;

a wheel hub rotatably mounted on said spindle;

[disc] brake means connected to said wheel hub and being rotatable therewith;

pickup means nonrotatably mounted on said spindle; and

a tone wheel connected to said hub and rotatable therewith, said tone wheel [having notches on an accessible surface;] *having a portion extending radially with respect to said hub and terminating in an axially extending flange, said flange having axially extending notches;*

said pickup means being located in close proximity with said notches [movable relative thereto], *said notches being movable relative to said pickup means* to generate a signal representative of the rotational velocity of said tone wheel, *said pickup means being movable radially with respect to said hub toward and away from the notches on the flange* and further comprising [projections on] *means projecting from* said pickup means to locate said pickup means a predetermined distance from said tone wheel and to protect said pickup means from damage due to normal vibrations.

Re. 29,510

HIGH EFFICIENCY SWITCHING DRIVE FOR A RESONATE POWER TRANSFORMER

George Robert Hull, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Original No. 3,987,355, dated Oct. 19, 1976, Ser. No. 561,740, Mar. 24, 1975. Application for reissue Dec. 10, 1976, Ser. No. 749,582

Int. Cl.² H02M *7/537*

U.S. Cl. 363—21 **6 Claims**

1. A circuit for improving the efficiency of an energy conversion apparatus, comprising:

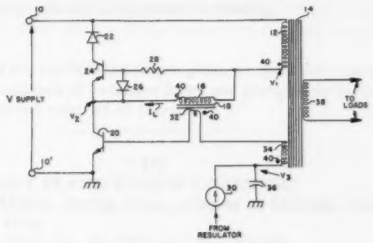
a resonate transformer having primary windings and secondary windings electromagnetically coupled thereto for converting the energy;

means, coupled to said primary windings, for storing energy [developed by said primary windings];

first switch means coupled to said means for storing energy, said first switch means having a first condition and a second condition;

means for impressing a potential of an external energy source across said primary windings and said means for storing energy in said first condition of said first switch means; and

second switch means coupled to said primary windings and operatively disposed across said means for storing energy in said second condition of said first switch means for impressing energy stored in said first condition to said primary windings thereby improving efficiency of the apparatus.



PLANT PATENTS

GRANTED JANUARY 3, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,174
LILY PLANT: LILIUM 'HEADLIGHT'

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Gresham, Oreg.

Filed Jan. 21, 1977, Ser. No. 761,224
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive variety of Asiatic hybrid lily plant substantially as herein shown and described, characterized by its single stem of dark green color, its abundant lanceolate deep green foliage, the deep reddish orange color of its buds upon first division, and their deep golden orange color upon unfurling, the excellence of its flower form, the exceptional breadth and fine substance of the tepals, the rich golden orange color of the tepals when the flower is in bloom, the resistance of the plant and flower to disease and its tolerance to infection by virus, and the versatility of the plant both as a garden plant and a plant rapidly produced from precooled bulbs forced for cut flowers or pot plants.

4,175
LILY PLANT: LILIUM 'FIRECRACKER'

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Gresham, Oreg.

Filed Jan. 21, 1977, Ser. No. 761,225
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive variety of Asiatic hybrid lily plant substantially as herein shown and described, characterized by its stately habit, relatively short foliage, high bud count, deep bud color, its great resistance to disease; its high tolerance of viral infection; the vigorous growth and propagative characteristics of its clone; its rapid growth and suitability for forcing; its excellent bud color prior to the flowers opening; and the deep scarlet color of its flowers.

4,176
LILY PLANT: LILIUM 'FIREBRAND'

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Gresham, Oreg.

Filed Jan. 21, 1977, Ser. No. 761,227
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive variety of Asiatic hybrid lily plant substantially as herein shown and described, characterized by its tall, stately and erect growth, the great vigor of its growth, its strong dark-colored stem, its abundant deep green foliage, its numerous buds colored deep red when the tepals first divide and unfurl, the fine form and texture of the flowers, the exceptionally broad tepals, the distinctive vibrant deep red color of the flowers, its rapid propagation characteristics, its superb disease resistance, its high tolerance to virus, and its suitability for use both as a garden flower and as a cut flower produced by forcing precooled bulbs.

4,177
LILY PLANT: LILIUM 'SHOWBOAT'

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Gresham, Oreg.

Filed Jan. 21, 1977, Ser. No. 761,228
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive variety of Asiatic hybrid lily plant substantially as herein shown and described, characterized by its high resistance to disease, its tolerance to virus, the vigorous growth and propagation characteristics of its clone; its versatility both as a garden plant and a plant produced from precooled bulbs forced for cut flower and pot plant; its erect and stately form; the excellence of its flower form; and particularly by the intense blood red color of its flowers.

4,178
LILY PLANT: LILIUM 'LOVESONG'

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Gresham, Oreg.

Filed Jan. 21, 1977, Ser. No. 761,229
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive variety of Asiatic hybrid lily plant substantially as herein shown and described, characterized by its short to medium height, its bushiness, its abundant foliage comprising lanceolate deep green leaves, the vigor of its growth, the rapidity of its propagation, its resistance to disease and tolerance to virus, its longevity, its suitability for pot culture, and in particular the vibrant clear deep scarlet color of its buds upon dividing and unfurling and of its flowers when the plant is in full bloom.

4,179
LILLY PLANT: LILIUM 'TWILIGHT'

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Gresham, Oreg.

Filed Jan. 21, 1977, Ser. No. 761,231
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive variety of Asiatic hybrid lily plant substantially as herein shown and described, characterized by its high resistance to disease; its high tolerance to virus; the vigorous growth and propagation characteristics of its clone; the excellence of its flower form; its versatility both as a garden plant and a plant produced from precooled bulbs forced for cut flower; and in particular by its rose-orchid color tone, which is unique in the hybrid Asiatic division of lilies suited to forcing and mass commercial cultivation.

4,180
LILY PLANT: LILIUM 'CHARISMA'

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Gresham, Oreg.

Filed Jan. 21, 1977, Ser. No. 761,232
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive variety of Asiatic hybrid lily plant substantially as herein shown and described, characterized by the distinctive genetically short habit of the plant, the exceptional length of the plant leaves, the resistance of the plant to disease; its high tolerance of viral infection; the vigorous growth and propagation characteristics of its clone; the excellence of its flower form; the versatility of the plant both as a garden plant and as a pot plant uniformly and rapidly forced out of season from precooled bulbs; and in particular by the pure, unspotted, vibrant golden-orange color of its flowers.

4,181
LILY PLANT LILIUM 'DAYSPRING'

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Gresham, Oreg.

Filed Jan. 21, 1977, Ser. No. 761,233
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive variety of Asiatic hybrid lily plant substantially as herein shown and described, characterized by its erect and stately form, its vigorous growth, its full foliage of

lanceolate dark green leaves, its excellent inflorescence, its high count of buds which turn lemon yellow as the tepals first divide and begin to unfurl, its flowers comprising tepals soft lemon yellow at the tips and gold with light spotting in the centers, its high resistance to disease, its high tolerance to virus, its vigorous growth and propagation characteristics, and its suitability for propagation by forcing precooled bulbs in the production of potted plants and cut flowers.

PATENTS

GRANTED JANUARY 3, 1978

ERRATA

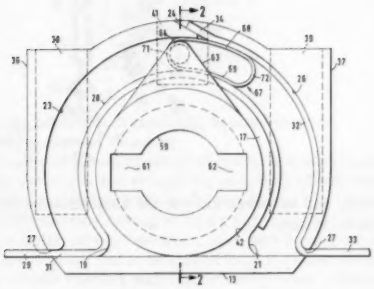
For CLASS	See PATENT NO.
200–011 R	4,065,812
308–003.5	4,065,852
364–200	4,065,862
051–166 FB	4,065,886
051–358	4,065,887
116–034 R	4,066,033
124–086	4,066,051
366–139	4,066,245
366–293	4,066,246
366–024	4,066,247
029–623.5	4,066,418
209–082	4,066,534
544–017	4,066,641
023–259	4,066,646
560–260	4,066,685
424–312	4,066,692
426–282	4,066,813
235–054 F	4,066,871
353–026 A	4,066,872
235–487	4,066,873
364–426	4,066,877
364–724	4,066,878
364–498	4,066,879
235–302.3	4,066,880
364–726	4,066,881
235–302	4,066,882
235–304	4,066,883
362–016	4,066,884
362–018	4,066,885
362–068	4,066,886
362–341	4,066,887
362–223	4,066,888
362–102	4,066,889
363–037	4,066,954
363–068	4,066,955
363–131	4,066,956
352–012	4,066,963
365–043	4,067,002

PATENTS

GRANTED JANUARY 3, 1978

GENERAL AND MECHANICAL

4,065,812
SWITCH FOR CONTROLLING DOOR LOCKS
Dieter Reichert, Bismarckstrasse 49, 7031 Gartringen - BRD, Germany
Filed Sept. 14, 1976, Ser. No. 723,082
Claims priority, application Germany, Aug. 5, 1976, 2635255
Int. Cl.[2] H01H *19/36, 27/00*
U.S. Cl. 200—11 R **17 Claims**



1. A switch for controlling door locks, which door locks comprise a non-rotatable locking cylinder case, a locking cylinder which can be rotated from outside by an inserted door key, a resetting spring for returning the locking cylinder to a neutral position from an "open" position and to the neutral position from a "closed" position, which switch comprises:

a stator which is rigidly and non-rotatably connected to the locking cylinder case and is coaxial with the geometric longitudinal axis of the door lock,

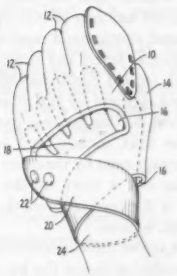
a rotor which is rigidly and non-rotatably connected to the locking cylinder of the door lock, is coaxial to the geometric longitudinal axis of the door lock and rotatably mounted by the stator and has a driver thereon,

said stator being provided with two electric conductors of circular arc form which extend coaxially and concentrically with one another and overlap in a first angular section, but not in the second angular section, a non-conductive slide surface in the second angular section, and an electrically conductive slip ring between the conductors which contacts both the conductors and comprises an aperture in which said driver of said rotor engages,

the frictional connection between said slip ring and said conductors and said slide surface being such that said slip ring can only be moved out of a position of rest by said driver,

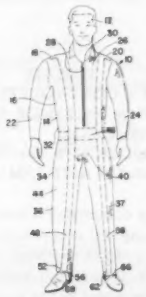
said slip ring and said aperture for engaging said driver having an angular length such that said slip ring is drawn between said conductors when the locking cylinder is turned into the "closed" position, but not fully drawn out of this position of contacting the conductors when the locking cylinder is returned to the neutral position, and such that the slip ring is drawn into the area of said slide surface when said locking cylinder is rotated into the "open" position, but not fully drawn out of this position, which does not make contact with at least one of said conductors, when the locking cylinder is returned to the neutral position.

4,065,813
BALL PLAYER'S GLOVE
Kirk R. Hudson, 2031 Asilomar Drive, Oakland, Calif. 94611
Filed June 24, 1976, Ser. No. 699,288
Int. Cl.[2] A41D *13/10*
U.S. Cl. 2—19 **3 Claims**



1. In a ball player's glove having an opening for the insertion of the player's hand to manipulate the glove, improved means for holding the glove on the player's hand comprising a strap means having one end attached to one side of the opening and a second opposite end, and means for detachably attaching the second end of the strap means to the other side of said opening, said strap means having sufficient length to loop completely around the wrist of the player intermediate its ends to secure the glove to the player so that the glove will not accidentally come off the player's hand and the glove can be manipulated more easily.

4,065,814
ONE PIECE ELASTIC BODY SUIT
Edgar N. Fox, 2301 H St., NE., #132, Washington, D.C. 20002
Filed Aug. 24, 1976, Ser. No. 717,214
Int. Cl.[2] A41D *13/02*
U.S. Cl. 2—79 **4 Claims**



1. A one piece elastic body toning suit adapted to be worn by a person for toning the body of said person, which comprises:

a. an outer cloth-like layer having a shirt section and a trouser section, and shirt section having a waist band portion, a front, a back, a pair of shoulder portions, and a pair of arm portions, said trouser section having an upper front portion, a rear seat portion, and a pair of leg portions;

b. said shirt section and said trouser section having an inner cloth-like layer, said inner cloth-like layer secured to said outer cloth-like layer;

c. a plurality of elastic band members disposed between said outer and said inner layers, including:

an elastic waist band member extending around said waist portion of said suit;

a first elongated elastic band member, disposed between said inner and outer layers and attached to said waist band member, said first band member having a first end adapted for engagement by one foot of the wearer, having a central portion passing over a first shoulder portion of the shirt section, and having a second end adapted for engagement by the foot of the wearer so that, when the suit is worn by the wearer, said first band member is disposed adjacent the front and rear of one leg of the wearer; and,

a second elongated elastic band member, disposed between said inner and outer layers and attached to said waist band members, said second band member having a first end adapted for engagement by the other foot of the wearer, having a central portion passing over a second shoulder portion of the shirt section, and having a second end adapted for engagement by the other foot of the wearer so that, when the suit is worn by the wearer, said second band member is disposed adjacent the front and rear of the other leg of the wearer,

whereby when a leg of the wearer is bent, a front portion of the elastic member adjacent the leg is stretched.

4. An elastic body toning garment including:

an outer fabric trouser section;

an inner fabric trouser section secured to said outer section to form a one-piece garment;

an elastic waist band member disposed between the inner and outer trouser section extending around a waist portion of the trouser sections and secured thereto;

a front elastic band member disposed between the inner and outer trouser sections which front band member is attached to the waist band member and extends downwardly along the front of a leg of the trouser sections;

a rear elastic band member which rear band member is attached to the waist band member and extends downwardly along the rear of the leg of the trouser sections; and

a stirrup member, for engaging the foot of the wearer, attached to lower ends of the front and rear elastic band members.

4,065,815

HYDRAULICALLY CONTROLLED ARTIFICIAL LEG

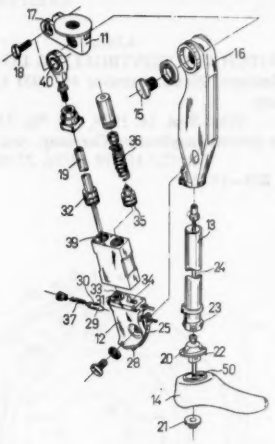
Chen Sen-Jung, 1st Floor No. 236-238, Section 3, Ho-Ping West Road, Taipei, China /Taiwan

Filed Sept. 28, 1976, Ser. No. 727,700

Int. Cl.[2] A61F *1/04, 1/08*

U.S. Cl. 3—1.2 **6 Claims**

1. An artificial leg comprising a hydraulic system which is connected to a pushing rod of an ankle cap through a transfer rod; a foot bearing a recess receiving one end of the pushing rod; and a knee with its two ends separately connected to an outer shell and a pole means of the hydraulic system, wherein the hydraulic system comprises a transfer arm with a protuberance formed thereon and pivoted upon a pin; a plug for stoppling oil flow and having a first hole formed thereon; a link means connecting the transfer arm and the plug; a set of oil inlet, outlet, passageways and adjuster for oil flow, said pole means having one end connected to the knee through a pivot and the other end shaped into a needle part which is inserted into a second hole in the hydraulic system at least partially in alignment with the first hole on the plug; and a piston part on the pole means for compressing the hydraulic oil through said oil passageways into a chamber in the hydraulic system, so that the knee joint of the artificial leg can straighten or bend automatically and synchronously to the ankle motion through the hydraulic system.



4,065,816

SURGICAL METHOD OF USING A STERILE PACKAGED PROSTHESIS

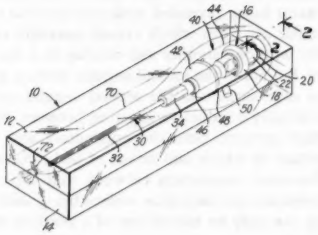
Philip Nicholas Sawyer, 7600 Ridge Blvd., Brooklyn, N.Y. 11209

Division of Ser. No. 579,791, May 22, 1975, Pat. No. 4,011,947.

This application Nov. 12, 1976, Ser. No. 741,476

Int. Cl.[2] A61F *1/22*

U.S. Cl. 3—1.5 **5 Claims**

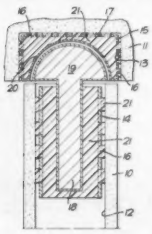


1. A method comprising mounting a prosthetic device on a support and removing at least substantially all foreign substance from the device and support, encapsulating the prosthetic device in a capsule, encasing said device and support in a removable shield, boxing the thusly encased device and support, irradiating the thusly boxed and encased device and support to sterilize the same, sequentially removing the box and shield, injecting a fluid into the capsule to treat the prosthetic device, opening the capsule to expose the device, and maneuvering the device by the use of the support to locate the device proximate a site of installation.

4,065,817
BONE PROSTHESIS AND METHOD OF FORMING A BONE JOINT

Per Ingvar Branemark, Andergatan 3, and Bo Thuresson Af Ekenstam, Akergatan 5,, both of S-431 39 Molndal, Sweden

Filed Apr. 23, 1976, Ser. No. 679,709
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 12 Claims

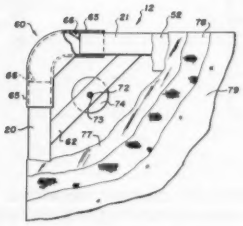


1. A bone prosthesis comprising, in combination:
a. a tubular support member;
b. a plurality of lateral openings disposed at spaced locations along the length and around the periphery of said support member and through the wall thereof;
c. a prosthesis body having at least a part locatable in part in said tubular support member, said part having an outer surface dimensioned to be spaced from the inner surface of said tubular support member, whereby bone cement can be introduced into said tube support member when the prosthesis body is in place and flows through said lateral openings: and
e. means for securing said body in place in said support member.

4,065,818
BOX SPRING CONSTRUCTION

Frederick P. Farina, 1985 Peterson Ave., Coquitlam, B.C., Canada (V3K 1M2)

Filed May 11, 1976, Ser. No. 685,423
Int. Cl.[2] A47C *19/00;* F16M *11/16*
U.S. Cl. 5—288 2 Claims

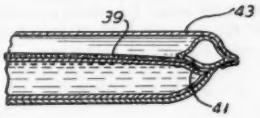


1. Box spring frame construction comprising a rectangular frame having parallel side rails and parallel end rails, said side and end rails being wooden boards of the same rectangular cross sectional stock, a plastic corner connector for each corner of the rectangular frame, each corner connector having a pair of sockets disposed at right angles to one another for receiving and interconnecting adjacent ends of side and end rails; said pair of sockets of each corner connector being defined by a common vertical web alongside outer surfaces of the side and end rails, top and bottom horizontal flanges alongside upper and lower edges of said side and end rails, and vertically opposed inner flanges alongside inner surfaces of said and end rails; stop means within the pair of sockets of each corner connector for limiting penetration of the side and end rails into said pair of sockets, a diagonal brace secured to the side and end rails near each corner connector, and a plurality of transverse slats interconnecting the side rails including end slats extending over the end rails and portions of the corner connectors.

4,065,819
FLOTATION SUPPORT SYSTEM

Jody A. Gorran, Highland Park, N.J., assignor to Medpro, Inc., East Brunswick, N.J.

Continuation-in-part of Ser. No. 616,045, Sept. 23, 1975, Pat. No. 3,983,587. This application June 16, 1976, Ser. No. 696,590
The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—371 11 Claims

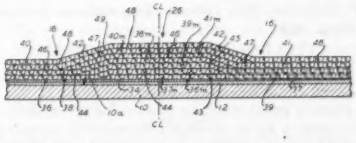


1. A flotation support system, comprising in combination:
a generally rectangular air frame, defined by a tubular air-filled member surrounding an open region;
a base sheet extending beneath said open region and under said tubular frame, and being secured to said tubular member toward the outer peripheral edge of said frame, to thereby define with said member a nesting receptacle bounded by a receiving slot defined between the upper side of said sheet and the adjacent wall of said member;
a fluid-containing envelope being positioned in said nesting receptacle; said envelope having dimensions exceeding those of said open region, and the peripheral border portions of said envelope being received into said receiving slot.

4,065,820
MOLDED BOAT HULLS

Medford L. Starratt, Jr., 2015 Beach Drive, SE., St. Petersburg, Fla. 33701

Filed Dec. 3, 1976, Ser. No. 747,399
Int. Cl.[2] B63B *5/24*
U.S. Cl. 9—6 P 1 Claim

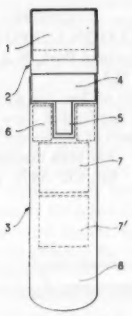


1. A molded boat hull comprising a wall having a plurality of longitudinally extending greater area portions, and longitudinal reinforcing stringers extending between said greater area portions; said greater area portions comprising plural, interbonded, woven fiber glass laminations, and said stringers being solid, and primarily comprising interleaved, interbonded, opposed marginal areas of pluralities of said fiber glass laminations of each of adjacent ones of said greater area portions.

4,065,821
ACOUSTIC BUOY

Guy Lepreux, Chevilly Larue, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Apr. 29, 1977, Ser. No. 792,369
Claims priority, application France, May 7, 1976, 76.13748
Int. Cl.[2] B63B *21/52*
U.S. Cl. 9—8 R 4 Claims



1. An acoustic buoy which can be dropped from a plane, said buoy comprising a float, a plunger and an air brake connected to the float, said plunger being provided at its top with a casing which extends the wall of the float and in which the bottom part of the float moves piston-like, said bottom part of the float being provided with a bottom bearing a plurality of studs and normally being in the locked position and pushed down inside said casing, said bottom comprising bent spring blades, each spring blade being fixed at a first end to a stud of the bottom of the float and having its second end projecting within an opening provided in the cylindrical casing at a higher level than that occupied by the first ends of the blades in a latched position; a spacer integral with the studs at points situated just below the fixing points of the first ends of the spring blades, said spacer acting as a stop for the spring blades when the float rises above its locked position in the casing; a blocking device which when it is active prevents any pushing of the float into the casing, said spring blades in the locked position being extended and tending to push the float down into the casing, means for rendering said blocking device passive as soon as the float rises above the locked position in the casing subsequent to the opening of the air brake device of the buoy with the length of the spring blades being such that when the spacer is pushed down into the casing until it touches a stop integral with the plunger, the second ends of the spring blades escape from the openings of the casing to thereby release the float from the plunger.

4,065,822
SINGLE POINT MOORING WITH STRAIN RELIEF ANCHORING

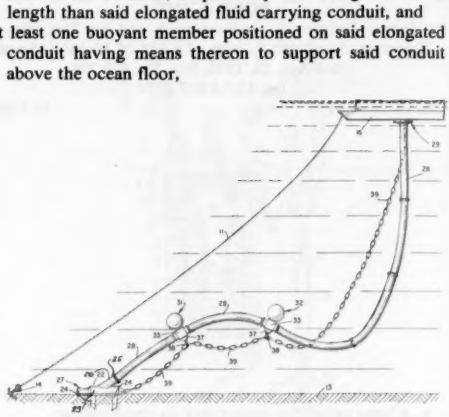
James P. Wilbourn, New Orleans, La., assignor to Texaco Inc., New York, N.Y.

Filed Feb. 27, 1976, Ser. No. 661,915
Int. Cl.[2] B63B *21/52*
U.S. Cl. 9—8 P 2 Claims

1. In a single point mooring system for an offshore body of water wherein a buoy having a detachable coupling means floats at the water's surface, a resilient, elongated fluid carrying conduit extends dowwardly from said buoy and communicates with a subsea terminal fixedly disposed at the ocean floor, said elongated conduit being communicated with a remote source of fluid, a plurality of hold down cables spaced about said buoy having one end thereof connected to the buoy, and having the other end spaced from said subsea terminal and anchored at the ocean floor,

a nonrigid restraining member extending between, and having opposed ends thereof connected to said buoy and to said subsea terminal, respectively and being shorter in length than said elongated fluid carrying conduit, and

at least one buoyant member positioned on said elongated conduit having means thereon to support said conduit above the ocean floor,

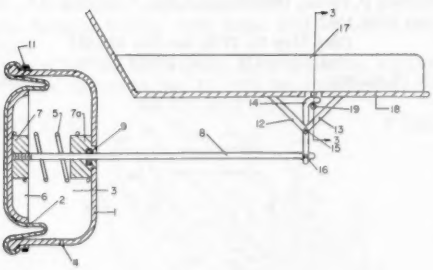


said buoyant member being fixedly connected to said at least one elongated conduit, and being slidably connected to said restraining member whereby to permit limited relative movement between said buoyant member and said restraining member.

4,065,823
HYDROSTATICALLY ACTIVATED RELEASE MECHANISM

James Walter Lorenzen, 6956 Colonial Drive, and Bruce John Schaefer, 2707 Russell Road, both of Tecumseh, Mich. 49286

Filed Nov. 12, 1976, Ser. No. 741,342
Int. Cl.[2] B63B *21/52;* B63C *9/28*
U.S. Cl. 9—9 7 Claims



1. A hydrostatically operated mechanism for releasing a floatation seat cushion comprising an activating device consisting of a hollow body, a flexible wall capable of movement in response to a pressure differential which is secured across said hollow body to form a single chamber which is vented to the atmosphere, and a means for transmitting movement of the flexible wall to a means which releases the floatation cushion.

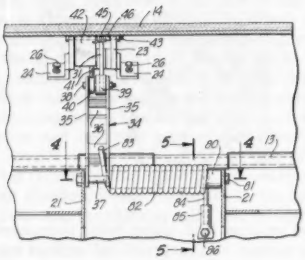
4,065,824
LIP EXTENDER FOR LOADING DOCK LEVELERS

Lawrence D. Ellis, Monrovia, and Robert E. Evans, Pasadena, both of Calif., assignors to Ellis Industries, Inc., South El Monte, Calif.

Continuation-in-part of Ser. No. 577,754, May 15, 1975, Pat. No. 3,974,537. This application Aug. 4, 1976, Ser. No. 711,477
Int. Cl.[2] B65G *11/00*
U.S. Cl. 14—71.3 9 Claims

1. A lip extender for use with a loading dock leveler of the

type having a vertically directed base plate, a bridge plate pivotally connected to said base plate and a lip pivotally mounted along its inner edge to the outer edge of the bridge plate, said lip extender comprising a lower link pivotally connected at its lower end to said base plate, a toggle arm pivotally connected at its upper end beneath said lip, the opposite ends of said lower link and toggle arm being constructed and arranged so that upon lifting of said bridge plate, the pivotally connected ends of said lower link and toggle arm move into an over-center locking engagement with each other to hold said bridge plate and lip in an elevated position, and a cam mounted beneath said bridge plate, said cam having a cam surface, a cam follower carried by the pivotal connection between said toggle arm and said lower link, and an elongated heavy duty coil spring disposed adjacent to the lower end of said lower link, one end of said coil spring bearing against said base plate and the other end of said coil spring bearing against the lower end of said lower link to counter-balance the weight of said bridge plate and lip through said lower link and toggle arm.



4,065,825

LOADING RAMP

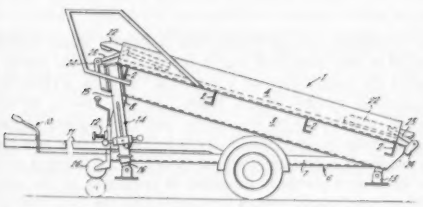
Antony Cohen, 1 Bowden Lane, Southampton, Hampshire, England

Filed Mar. 19, 1976, Ser. No. 668,633

Claims priority, application United Kingdom, Mar. 25, 1975, 12482/75

Int. Cl.[2] E01D *15/00*

U.S. Cl. 14—72.5 **23 Claims**



20. A loading ramp for positioning adjacent the bed of a lorry for loading vehicles thereonto and comprising

a framework of girders,

decking on the girders,

legs of variable length inclined at an angle of less than 90° with respect to the framework and rigidly joined to the framework at or adjacent one end thereof, which legs comprise two telescopic members, a first of the telescopic members being rigidly secured at its upper end to said one end of the framework and a second of the telescopic members being provided at its lower end with at least one foot to bear on the ground,

on which legs the framework can be supported at an inclination to the ground with the other end of the framework in contact with the ground, so that vehicles can be winched up or down said decking, and said inclination being variable in accordance with the extent to which said legs are lengthened,

the legs including internal gearing incorporating a worm and coupled by a cross shaft rotatable manually by means of a crank handle whereby the said telescopic members can be moved together each with respect to its first telescopic member to lengthen or shorten the leg as desired,

wheels on which the ramp is mounted,

coupling means whereby the ramp can be trailed behind a motor driven vehicle, and

a rigid sub-framework mounting the wheels and engaged with and longitudinally moveable with respect to the framework of girders, which rigid sub-framework is so formed and so engaged with the framework that when trailed behind a towing vehicle the decking is at an inclination to the ground but at a lesser inclination than that required for loading vehicles on to the bed of a lorry.

4,065,826

GLOVES

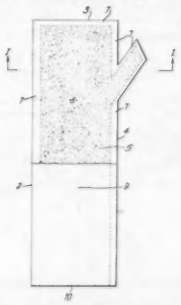
Edmund Alan Hough, Wavre, Belgium, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 24, 1975, Ser. No. 634,749

Claims priority, application United Kingdom, Dec. 6, 1974, 52836/74

Int. Cl.[2] A46B *5/04;* **A47K** *7/02*

U.S. Cl. 15—227 **8 Claims**



1. A disposable waterproof glove comprising an outside layer which is a laminar pile surfaced material with the pile surface outermost, first and second inside water impervious layers of thermoplastic film, said three layers being superimposed and joined together completely around only three edges to form a glove having an open end, said laminar pile surfaced material having been formed by feeding a thermoplastic material and a porous backing to a heated surface with the thermoplastic material between the backing and the heated surface so that the thermoplastic softens and bonds to the backing as well as adhering to the heated surface so that the combination of the thermoplastic and peeling the backing away from the heated surface draws the thermoplastic into fibrils or tufts to provide a pile surface on the porous backing, whereby in use a hand inserted into the glove between said first and second inside layers is protected from the material on the pile.

4,065,827

MOUNTING OF ROLLERS FOR PATIO DOORS

Martin John Aardal, Ewell, England, assignor to Schlegel (UK) Limited, Leeds, England

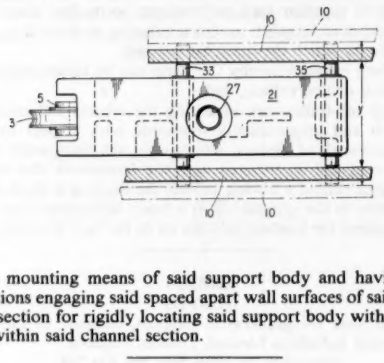
Filed Apr. 23, 1976, Ser. No. 679,707

Int. Cl.[2] E05D *13/02*

U.S. Cl. 16—106 **8 Claims**

1. A roller support for a patio door having a bottom frame member which has a channel section having spaced apart wall surfaces, comprising a roller and a support body mounted

between said wall surfaces of said channel section, said roller being supported on said support body, said support body having at least two side faces, each of said side faces having at least two spaced mounting means, and locating means mounted in



said mounting means of said support body and having end portions engaging said spaced apart wall surfaces of said channel section for rigidly locating said support body with a close fit within said channel section.

4,065,828

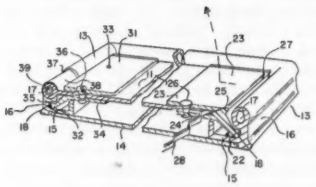
HINGEING ATTACHMENT

Alfred John Lancaster, 65 Bingara Rd., Beecroft, New South Wales 2119, Australia

Filed May 5, 1976, Ser. No. 683,580

Int. Cl.[2] E05D *3/00, 7/00*

U.S. Cl. 16—128 R **5 Claims**



1. A hinge mechanism comprising first and second members, said first member being in the form of a bracket defined by a lateral limb and an upstanding limb integral therewith and defining a recess at the intersection between said limbs, the upstanding limb presenting a curved surface above said recess, said second member being movable with respect to said first member and having a projecting flange with a rounded extremity dimensioned complimentarily to seat within the recess and a web located rearwardly of said extremity and dimensioned to cooperate with the curved surface of said first member, said first and second members cooperating with one another in such manner that upon relative opening movement of said hinge members the second member has part of its movement guided by engagement of the flange extremity in the recess and a further part of its movement guided by engagement of the flange web on the curved surface of the upstanding limb of the first member.

4,065,829

OVER-CENTER HINGE

Karl Lautenschlager, Reinheim, Odenwald, Germany, assignor to Karl Lautenschlager KG., Mobelbeschlagfabrik, Reinheim, Odenwald, Germany

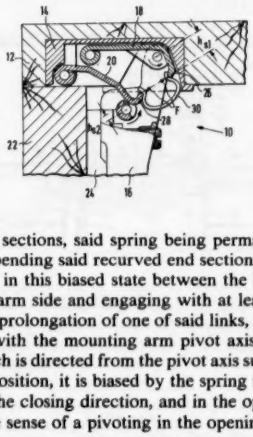
Filed Sept. 13, 1976, Ser. No. 722,433

Claims priority, application Germany, Sept. 16, 1975, 2541144; Feb. 14, 1976, 2606001

Int. Cl.[2] E05D *11/06, 3/06*

U.S. Cl. 16—145 **13 Claims**

1. An over-center hinge for use in furniture having a door part and a wall part, having a mounting arm comprising: two hinge links articulated pivotingly in the manner of a quadruple pivot on the door part and on the wall part, each hinge link having a pivot point with a pivot pin or a journal hole, said hinge upon swinging from the closed position to the open position being movable through a dead center position, a spring for biasing said hinge on one side in the closing direction and on the other side in the opening direction, said spring being provided in the space between the hinge link pivot points on the mounting arm side, said spring being a bending spring of springy material, curved into a C-shape and having short,



re-curved end sections, said spring being permanently biased by elastically bending said recurved end sections together and being snapped in this biased state between the hinge links on the mounting arm side and engaging with at least one of said end sections a prolongation of one of said links, said prolongation forming with the mounting arm pivot axis of this link a lever arm which is directed from the pivot axis such that, in the hinge-closed position, it is biased by the spring in the sense of a pivoting in the closing direction, and in the open position it is biased in the sense of a pivoting in the opening direction.

4,065,830

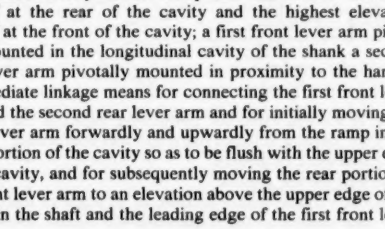
LARDING UTENSIL

Ludwig Pfatischer, Ludwig-Thoma-Strasse 63, 8183 Rottach-Egern, Germany

Filed May 19, 1976, Ser. No. 687,983

Int. Cl.[2] A22C *5/00, 17/00;* **A23B** *4/02*

U.S. Cl. 17—42.1 **9 Claims**



1. A larding needle comprising a needle shank which is pointed at the front and which has a longitudinal cavity extending the length thereof; a handle at the back; a ramp in the longitudinal cavity which ramp has the lowest elevation thereof at the rear of the cavity and the highest elevation thereof at the front of the cavity; a first front lever arm pivotally mounted in the longitudinal cavity of the shank a second rear lever arm pivotally mounted in proximity to the handle; intermediate linkage means for connecting the first front lever arm and the second rear lever arm and for initially moving the front lever arm forwardly and upwardly from the ramp in the front portion of the cavity so as to be flush with the upper edge of the cavity, and for subsequently moving the rear portion of the front lever arm to an elevation above the upper edge of the cavity in the shaft and the leading edge of the first front lever arm.

4,065,831

STOP MOTION FOR DRAWING FRAMES

Arnold G. Huntsinger, 604 E. Georgia Ave., Bessemer City, N.C. 28016

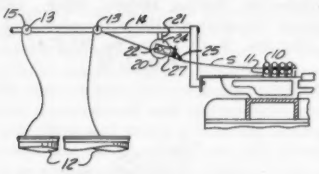
Filed June 15, 1976, Ser. No. 696,179

Int. Cl.[2] D01G *31/00*

U.S. Cl. 19—.25 **1 Claim**

1. In a drawing frame having upper and lower drafting rolls

and a creel for guiding a plurality of strands of sliver from supply cans to the drafting rolls, said creel including a longitudinal frame, a plurality of creel arms extending transversely above the supply cans, and a strand guiding passageway above each supply can and carried by one of said creel arms, the combination of a stop motion supported by said creel frame between the proximate supply cans and the upper and lower drafting rolls, said stop motion including a freely rotatable tubular guide beneath which a plurality of strands are directed in their passage from the supply cans to the drafing rolls, said tubular guide being positioned in the path of said strands and functioning as a leveler bar to displace the strands downwardly from their direct path between the proximate transverse creel arm and the drafting rolls, said tubular guide being freely rotatable in response to movement of the sliver therebeneath as it moves from the supply cans to the drafting rolls, a plurality of disc guides carried by said tubular guide in spaced relation to each other and said disc guides being alternately spaced with said strands along the longitudinal axis of the tubular guide so that the disc guides space the strands from each other and prevent abrasion, means responsive to breakage of one of said strands to stop the drafting rolls, said tubular guide being



journaled on a support rod depending from the creel frame and extending in perpendicular relation to the path of the strands from the supply cans to the drafting rolls, a pair of arms extending in parallel relation to each other downwardly from the ends of the support rod toward the drafting rolls, said means for stopping the drawing frame in the event of strand breakage being carried by said arms, said means for stopping the drawing frame including a pivot shaft extending between said arms, a plurality of detectors pivotally mounted on said shaft and arranged in spaced relation to each other along said shaft, there being one detector for each strand and arranged in overlying relation to its respective strand extending from between adjacent disc guides, each detector including a spoon overlying and normally resting on its respective strand during normal operation, a contact tail extending from the spoon and projecting beyond the pivot shaft in the opposite direction from the spoon and serving as a counterweight, and a control bar extending between said arms in spaced parallel relation to said pivot shaft and positioned above the pivot shaft whereby downward movement of a spoon in response to breakage of a strand causes corresponding upward movement of the contact tail to engage the control bar and complete a circuit to stop the drawing frame.

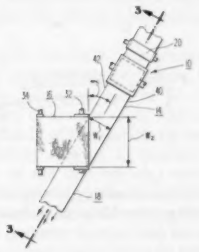
4,065,832

APPARATUS FOR FORMING A FIBROUS STRUCTURE

Rudolf Neuenschwander, Swarthmore, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Feb. 28, 1977, Ser. No. 772,990
Int. Cl.[2] D04H *1/00*
U.S. Cl. 19—156.3 **13 Claims**

1. An apparatus for use in the formation of a fibrous structure by entraining fibers in a fluid at an upstream end of a conveying duct, said conveying duct having laterally spaced-apart sidewalls, directing the fluid-entrained fibers in a downstream direction through the conveying duct to an open downstream end thereof and intercepting the open downstream end of the duct with a movable foraminous surface to collect the fibers on said surface in the form of a fibrous structure; the improvement wherein the foraminous surface is obliquely oriented to the direction of fiber flow through said duct so that the downstream distance of fiber flow from the upstream end of the duct to the point at which the flow is intercepted by the foraminous surface is greater adjacent one duct sidewall than adjacent the other duct sidewall whereby the lateral dimension



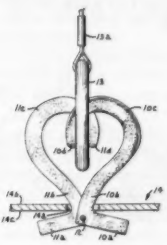
of the foraminous surface between the laterally spaced-apart duct sidewalls is greater than the width of the duct at its open downstream end, as measured between said duct sidewalls in a direction generally normal to the direction of fiber flow through said duct.

4,065,833

REMOVABLE TOGGLE LINK

Lawrence C. Bender, 2125 N. 88th St., Kansas City, Kans. 66109

Filed July 6, 1976, Ser. No. 702,700
Int. Cl.[2] A44G *13/00*
U.S. Cl. 24—201 A **4 Claims**



1. A removable link for installation in a blind aperture of a plate, said link comprising:

a pair of like parts each being coplanar and generally in the shape of the numeral "2", each said part having an aperture penetrating base leg and a hook member integrally joined at one end of said base leg, said hook member comprising a shank portion joined to said base leg and an arcuate portion integral with said shank portion curvingly extended through at least 180° and less than 360° to terminate in a hook end directed toward said base leg, thereby defining an opening to the bight of said arcuate portion;

pin means pivotally joining said like parts in reverse confronting engagement at the junctures of said base legs with said hook members thereof such that said base legs extend in opposite directions when said hook members are pivoted to overlie each other;

whereby said like parts may be pivotally rotated to an open position wherein said base legs align for insertion in said aperture and whereby said like parts may be pivotally rotated substantially 90° from the open position to a closed position wherein said base legs extend in opposite directions from said pin means and said hook members overlie each other to form a continuous loop.

4,065,834

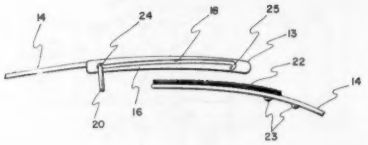
WATCHBAND

Archer A. Montague, Jr., Rte. 2, Box 589, Cary, N.C. 27511

Filed May 13, 1976, Ser. No. 686,037

Int. Cl.[2] A44B *17/00*

U.S. Cl. 24—204 **2 Claims**



1. A clasp means for releasably joining at least two elongated members comprising: a buckle portion on one of said members; a tongue portion on said second member; at least a portion of at least one surface on each of said buckle and tongue portions being covered with a contact adhering material; and a retaining means in the form of a generally C-shaped bail slidably mounted in an elongated, generally J-shaped slot on said buckle portion whereby said bail will at least partially encircle said tongue portion to prevent unintentional peeling separation of the adhered portions and said J-shaped slot will prevent accidental sliding of said bail when in the retaining position.

4,065,835

NET JOINTING STRUCTURE

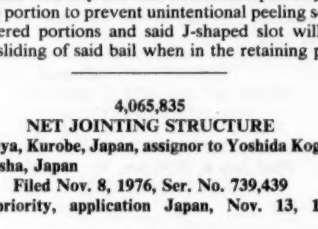
Kiyoo Yoneya, Kurobe, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Nov. 8, 1976, Ser. No. 739,439

Claims priority, application Japan, Nov. 13, 1975, 50-154411[U]

Int. Cl.[2] A44B *19/34*

U.S. Cl. 24—205.16 R **3 Claims**



1. A net jointing structure for jointing opposite net ends together comprising:

a. a pair of adapter nets each including a net region and a tape-carrying region extending outwardly from said net region;

b. a slide fastener for coupling and uncoupling said adapter nets, said slide fastener including a pair of stringer tapes carrying on and along their confronting inner edges a pair of series of interengageable fastener elements, said stringer tapes being secured to said tape-carrying regions, respectively, and said stringer tapes being taken into and out of mutual engagement by a slider movable along said fastener elements; and

c. a pair of connecting cords for connecting said adapter nets to the opposite net ends, each of said connecting cords being disposed in engagement with the outer edge of said net region;

d. each of said adapter nets being formed of a warp-knitted structure having a pair of opposite web portions and a net portion lying between said web portions, said warp-knitted structure being arranged symmetrically with respect to its central axis along which said warp-knitted structure is folded upon itself in exactly overlapped relationship to provide said adapter net so that the registered web portions and the folded net portion constitute said tape-carrying region and said net region, respectively, each of said connecting cords being interposed between said folded net portion and extending along the outer edge of said folded net portion, and said connecting cord being adapted to be pulled out of said folded edge through the meshes thereof at spaced points along the length thereof to provide a plurality of connecting turns connectable to the net end.

4,065,836

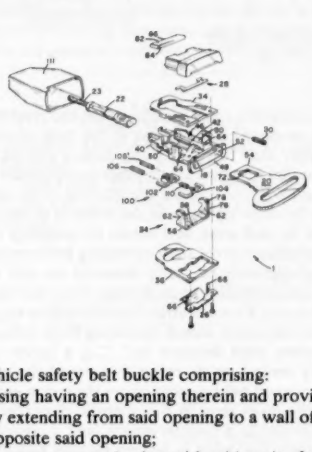
SAFETY BELT BUCKLE

Robert L. Stephenson, Sterling Heights, Mich., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Jan. 24, 1977, Ser. No. 761,574

Int. Cl.[2] A44B *11/26*

U.S. Cl. 24—230 A **11 Claims**



1. A vehicle safety belt buckle comprising:

a. a housing having an opening therein and provided with a cavity extending from said opening to a wall of said housing opposite said opening;

b. inlet means communicating with said cavity for receiving a tongue of a seat belt;

c. connecting means for connecting the housing to an anchorage point on the vehicle;

d. latching means for engaging said tongue;

e. first biasing means connected to said housing for biasing said latching means into engagement with said tongue;

f. locking means slidably mounted on said housing for locking engagement with said latching means;

g. second biasing means connected to said housing for biasing said locking means into said locking engagement;

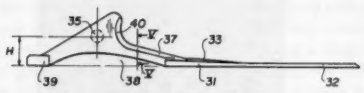
h. release means slidably mounted on said housing for rotating said latching means to move said locking means out of locking engagement therewith; and

i. ejecting means for ejecting said tongue from said housing comprising a plurality of ejecting slides and a plurality of spring means, a first of said spring means being connected between said housing and a first of said ejecting slides for biasing said ejecting slides toward said inlet means and a second of said spring means being connected between said first and a second of said ejecting slides for biasing said second of said ejecting slides toward said inlet means.

4,065,837
APPARATUS FOR CUTTING PILE FABRIC

Franz-Josef Gierse, Monchen-Gladbach; Carl-Christian Bastert, Korschenbroich, and Wilhelm Busch, Monchen-Gladbach, all of Germany, assignors to Franz Muller, Monchen-Gladbach, Germany

Filed Aug. 2, 1976, Ser. No. 710,365
Claims priority, application Germany, Aug. 2, 1975, 2534674
Int. Cl.² D06C *13/08*
U.S. Cl. 26—9 **5 Claims**



1. A cutting arm device for a cutting machine for cutting the individual loops of a weft pile fabric such as velvet, corduroy, or the like comprising a frame, a cutting arm having an end thereof pivotally mounted on said frame for pivotal movement about a first axis, a cutting head pivotally mounted on the other end of said cutting arm for pivotal movement about a second axis, said cutting head carrying a cutting knife for cutting the pile loops of a web of material passing underneath said cutting head, said first and second pivotal axes being disposed generally parallel to one another, and actuating means operatively connected between said first and second pivot axes providing for pivotal movement of said cutting head relative to said cutting arm about said second axis as said cutting arm is pivoted on the frame about said first axis, said cutting arm being pivotable in a plane substantially parallel to the plane of said web of material passing underneath said cutting arm, said cutting knife having a knife holder, a knife blade and a velvet point, said velvet point extending at one end of the cutting knife in the form of a needle connected successively to said knife blade and said knife holder, a knife-retaining arm, a shaft connecting said knife holder to said knife-retaining arm, another shaft, subjectible to a spring-biasing force in peripheral direction thereof, coupling said knife-retaining arm to said cutting head, said velvetpoint needle extending along a straight line at a side thereof facing toward a fabric web during travel of the latter in normal operation, said cutting knife being formed with a recess extending over a region thereof located below said shaft connected to said knife holder on said side of said needle and terminating at a projection located at the opposite end of said cutting knife from that at which said needle is located, said projection having a side thereof facing toward the traveling fabric web, said side of said projection being disposed on an extension of said straight line along which said side of said needle extends.

4,065,838
TENTER FRAME CLIP-OPENING WHEEL WITH RESILIENT RIM

Raymond R. Jungpeter, Arlon, Belgium, and Jean L. Buchholz, Luxembourg, Luxembourg, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 593,018, July 3, 1975, abandoned. This application Dec. 30, 1976, Ser. No. 755,724
Int. Cl.² D06C *3/04*
U.S. Cl. 26—94 **6 Claims**

1. Means for opening a tenter frame web clamping device including:

a tenter clip having an opening arm;

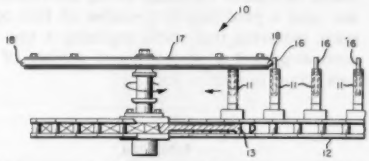
an opening wheel having a pre-glazed by use, oil-resistant, elastomer rim mounted on its periphery; and

means to move the opening arm into contact with the elastomeric rim to open the web clamping device and,

wherein the elastomeric rim is of polyurethane rubber having a hardness of at least about 90 Shore A and is fixedly mounted on the periphery of the opening wheel whereby inpact force as the opening arm is moved into contact with the rim is reduced and rate of wear of such rim is stabilized.

2. A device for opening tenter frame clips, such clips being mounted on an endless chain carried by a sprocket wheel and having means including a clamping surface and a pivotable clamping arm for clamping a web of material therebetween, such clamping arm being connected to a clip opening arm for pivoting the clamping arm into its open position, the improvement comprising:

a clip opening wheel rotatable on a common axis with the sprocket wheel and having a pre-glazed by use, oil-resistant, elastomeric peripheral rim of polyurethane rubber having a hardness of at least about 90 Short A adapted to rotate independently of the sprocket wheel, and such clip opening arm being adapted to contact the elastomeric peripheral rim of the clip opening wheel as the tenter frame clips are moved by the chain to open the tenter frame clips whereby impact force as the opening arm is



moved into contact with the rim is reduced and rate of wear of such rim is stabilized.

3. A web handling apparatus including:

a plurality of web clamping devices in a tenter frame mounted on a movable chain carried by a sprocket mounted for rotation about an axis, each clamping device including a clamping surface and a pivotable clamping part, such pivotable clamping part being connected to a clamping device opening arm;

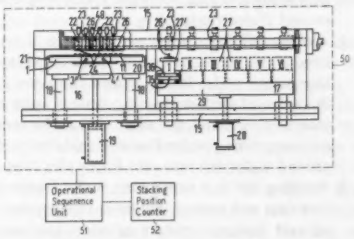
an opening wheel having a glazed by use, oil-resistant, elastomeric rim of polyurethane rubber having a hardness of at least about 90 Shore A mounted on the periphery thereof; and

means for moving the chain such that the opening arm contacts the elastomeric rim thereby moving the pivotable clamping part into its open position whereby impact force as the opening arm is moved into contact with the rim is reduced and rate of wear of such rim is stabilized.

4,065,839
METHOD AND APPARATUS FOR THE PRODUCTION OF STACKED, ETCHED PATTERNED METAL FOILS FOR COMPONENT ELEMENTS

Martin Pointner, Kirchseeon, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 15, 1976, Ser. No. 705,692
Claims priority, application Germany, July 25, 1975, 2533369
Int. Cl.² B21D *33/00*; B65G *57/04*
U.S. Cl. 29—17 R **9 Claims**



1. A method for the production of stacks of pre-etched,

patterned foils, each stack being provided to form a component comprising the steps of:

a. cutting individual patterned foils free from a mat comprising pre-etched patterned foils and also edge foils;

b. examining said patterned foils and discarding unwanted patterned foils and the edge foils;

c. stacking approved foils for a component by use of a stacking apparatus, said stacking comprising the step of

i. placing the individual patterned foils by individually movable transfer elements on individually arranged foil stacks, the number of foil stacks corresponding to the number of individual patterned foils in the mat, the patterned foils being placed on the arranged foil stacks in correspondence with their arrangement in said mat; and

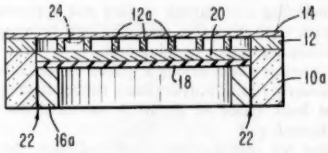
d. stacking additional patterned foils from additional mats onto the corresponding stacks and counting the foils placed on each of the stacks during each stacking operation until a predetermined number of foils occurs in a stack, removing that stack, beginning a new stack and continuing until a predetermined number of patterned foils occurs in another stack.

4,065,840

METHOD FOR FABRICATING A DSDT TARGET

Kyu C. Park, and Arnold Reisman, both of Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1976, Ser. No. 751,920
Int. Cl.² H01J 9/02
U.S. Cl. 29—25.14 **22 Claims**



1. Method of fabricating a DSDT target structure, comprising:

a. depositing a first dielectric layer on an etchable first wafer;

b. depositing a reflection layer on said first dielectric layer;

c. etching off the central portion of said first wafer from the back side to expose the dielectric layer and leave a supporting wafer frame around the layer edge; and

d. etching off said first dielectric layer from the wafer side to produce a plurality of pillars of said dielectric, said dielectric pillars being spaced apart across the area of said reflection layer;

e. depositing a secondary electron emission layer on an etchable second wafer;

f. depositing on said secondary electron emission layer a second dielectric layer;

g. etching off the central portion of said second wafer to expose said secondary electron emission layer and leave a supporting wafer frame around the layer edge, the outer diameter of said supporting wafer frame of said second wafer being about the same size as the inner diameter of said supporting wafer frame of said first wafer so that said second wafer fits into said first wafer; and

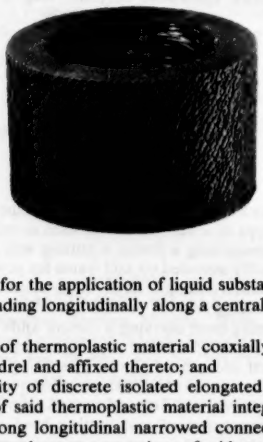
h. bonding the two supporting wafer frames of said respective first and second wafers to one another with the ends of said dielectric pillars adjacent said second dielectric layer; whereby said dielectric pillars provide a deformation action in the region between the pillars.

4,065,841

PRINTING ROLLER

Max Gysin, 279 Marlin St., Dix Hills, N.Y. 11746

Filed Aug. 23, 1976, Ser. No. 716,683
Int. Cl.² B41F 31/00
U.S. Cl. 29—121.1 **6 Claims**



1. A roller for the application of liquid substances having a mandrel extending longitudinally along a central axis comprising:

a. a sleeve of thermoplastic material coaxially surrounding said mandrel and affixed thereto; and

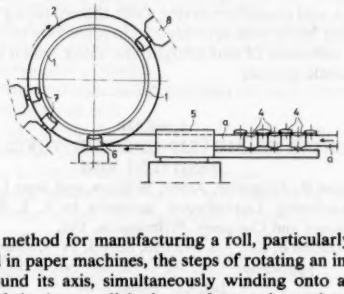
b. a plurality of discrete isolated elongated compressible strands of said thermoplastic material integral with said sleeve along longitudinal narrowed connecting portions of said strands to space portions of said strands from said sleeve for forming liquid collection pockets therebetween, whereby the liquid in the liquid collection pockets is forced outward therefrom when said elongated strands are compressed toward said sleeve.

4,065,842

ROLLS AND ROLL-MANUFACTURING METHODS

Eino Aatinen, Jyvaskyla, Finland, assignor to Valmet Oy, Finland

Continuation-in-part of Ser. No. 620,229, Oct. 6, 1975. This application Mar. 31, 1977, Ser. No. 783,449
Claims priority, application Finland, Apr. 2, 1976, 760904
Int. Cl.² A47J 43/28; F16G 11/00
U.S. Cl. 29—148.4 D **10 Claims**



1. In a method for manufacturing a roll, particularly of the type used in paper machines, the steps of rotating an inner roll body around its axis, simultaneously winding onto an outer surface of the inner roll body an elongated metal strip in a manner forming from said strip on said outer surface of said inner roll body a plurality of successive convolutions pressing against each other and covering said outer surface of said inner roll body at the area of said other surface where said strip is wound thereon, with said strip having an inner edge surface engaging said outer surface of said inner roll body, an outer edge surface distant from said inner roll body, and opposed side surfaces which extend between said inner and outer edge surfaces and which at each convolution engage over their entire areas the side surfaces of adjoining convolutions over the entire areas of the latter side surfaces, said strip having at

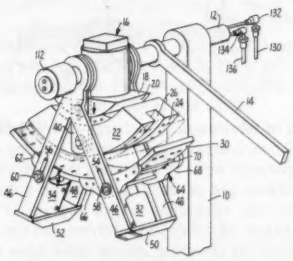
any instant during the winding thereof onto said inner drum body an end convolution which has an inner side surface engaging an adjoining side surface of the immediately preceding convolution and an outer side surface which is exposed at one end of the series of convolutions which have already been wound, and applying to said exposed outer side surface of said strip, during the winding thereof onto said inner drum body, at a location extending from said outer edge surface of said end convolution inwardly toward but terminating short of said outer surface of said inner drum body, a compressive force acting in the direction of the axis of said drum body and pressing said end convolution against the immediately preceding convolution with said compressive force having a magnitude sufficiently great to deform and elongate said end convolution at a region thereof spaced from said inner drum body where said force is applied to said end convolution.

4,065,843

BRAKE SHOE RIVET REMOVAL PRESS

Alfonso M. Elola, 1758 Highland Blvd., Hayward, Calif. 94542

Filed Oct. 4, 1976, Ser. No. 728,980
Int. Cl.² B23P *19/04*
U.S. Cl. 29—252 **9 Claims**



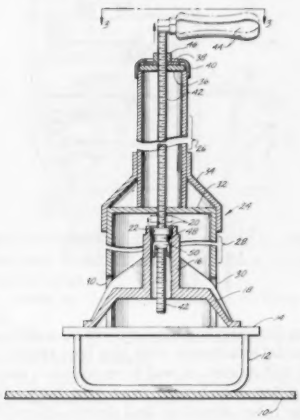
1. A press for the simultaneous removal of the lining attaching rivet of a brake shoe, said press comprising: an anvil for receipt of said brake shoe, said anvil having an arcuate surface shaped for conforming engagement with one side of a brake shoe received therein and a plurality of holes disposed for alignment with the lining attaching rivets of said brake shoe; a punch retaining member disposed in opposition to the anvil and having an arcuate surface shaped for conforming engagement with the side of a brake shoe received on said anvil opposite the side of said shoe engaged with the anvil; a plurality of rivet punches positioned for movement within holes in said punch retaining member, each of said punches having a punch end adjacent the arcuate surface of said member for movement therethrough, said punch ends being positioned so as to be simultaneously alignable with the lining attaching rivets of a brake shoe engaged between the anvil and member; clamping means for imparting relative movement to the anvil and retaining member to clamp said brake shoe therebetween with the openings of the anvil in alignment with the punch ends of the punches and the lining attaching rivets of the shoe in aligned interposed relationship between said aligned openings and punch ends; pressing means for applying a force against the punches to simultaneously drive said plurality of punches through the holes in said anvil and into engagement with the lining attaching rivets of a brake shoe aligned with said holes to drive the rivets into the holes of the anvil aligned therewith.

4,065,844

BEARING PULLER FOR WASHING MACHINES

Martin J. Lieser, and Donna Jean Lieser, both of 2540 Kirkland Ave., Escondido, Calif. 92025

Filed Aug. 9, 1976, Ser. No. 712,688
Int. Cl.² B23P *19/04*
U.S. Cl. 29—258 **3 Claims**



1. A tool for removing the annular upper spin tube bearing from an automatic washing machine having a generally cylindrical main bearing housing supported by a pair of angulated legs above a mounting plate having an access opening therein through which the bottom of said main bearing housing is accessible, said tool comprising;

a. an elongated rigid sheath having: (i) an upper cylinder; and, (ii) a lower cylinder coaxial with and of larger diameter larger than said upper cylinder and dimensioned to fit over said main bearing housing;

b. said lower cylinder having two opposed cut away portions to receive said legs and a lower plane-defining edge to rest on said mounting plate such that the interior of said cylinder is accessible through the opening in said plate;

c. said upper cylinder having an upper end plate thereover with a bore therethrough;

d. a second plate having a central bore therein and disposed atop said lower cylinder such that said upper cylinder is supported on said second plate and including means to retain said second plate on said lower cylinder and center said upper cylinder on said second plate;

e. a threaded shaft extending through the bores in said plates and passing through said cylinders;

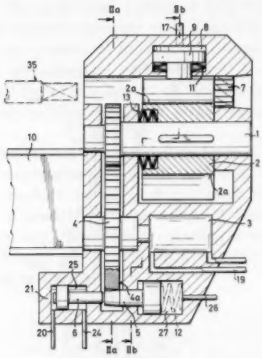
f. a removable pressure disc retained on the lower end of said shaft, said pressure disc being of a diameter greater than the interior diameter of said upper spin tube bearing;

g. a threaded nut disposed on said shaft above said end plate, whereby said cylinder can be disposed over a main bearing housing of a washer with the cut-away portions oriented over the angulated legs thereof, and said shaft can be lowered through said cylinder and through the upper spin tube bearing of said machine, said disc can be retained on the lower end of said shaft, and by rotating said threaded nut to elevate said shaft, said upper spin tube bearing will be removed from the bearing housing.

4,065,845
DEVICE FOR CHANGING BORE CROWNS

Rolf Strom; Veikko Heikkila, and Leo Hakkinen, all of Tampere, Finland, assignors to Oy Tampella AB, Finland

Filed Apr. 21, 1975, Ser. No. 569,985
Claims priority, application Finland, Apr. 23, 1974, 741219
Int. Cl.[2] B23Q 3/157; E21C 19/04
U.S. Cl. 29—283 2 Claims



2. A device for changing bore crowns on a drill rod having means for coaxial attachment with said bore crown upon rotation of a drill rod relative to said bore crown in one rotational direction and for detachment from said bore crown upon rotation in the other direction, said device comprising

a rotatably mounted bore crown magazine, said magazine having a plurality of circumferentially spaced axial bores formed therethrough wherein each of said axial bores is adapted to carry one of said bore crowns therein, and

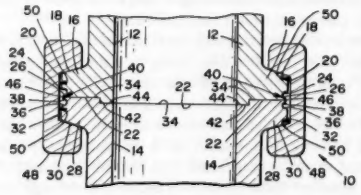
means for rotationally positioning said magazine so that one of said axial bores in said magazine is coaxial with the axis of a drill rod

said means for rotationally positioning said magazine comprising gear transmission means including at least one gear means for rotating said magazine member, and a plurality of notches provided on said at least one gear and said rotational positioning means further comprising a first pin and second pin, said pins being axially aligned and having different diameters and means selectively moving said pins into and out of said notches to thereby rotationally position said magazine in rotational increments equal to one-half the difference in diameter between said pins.

4,065,846
PROCESS FOR CONSTRUCTING CLAMP-WELDED PIPE JOINT

Byron Herbert Leonard, Jr., Atherton, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Filed June 14, 1976, Ser. No. 695,605
Int. Cl.[2] B23Q 17/18; B23P 7/00
U.S. Cl. 29—407 18 Claims

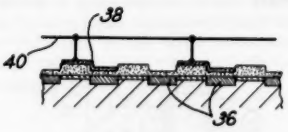


1. A process for assembling a pipe joint across pipe sections comprising the steps of: providing first and second male skirts each having mutually opposed machined and mated surfaces and each having an annular ridge juxtaposed to the outer portion of said machined surfaces extending around the periphery of confronting pipe segments; juxtaposing said skirts to define a combined ridge from each said annular ridge; bringing said skirts into intimate, substantially uniform pressure contact through opposing forces applied to each said pipe section across said pipe sections at said opposed machined surfaces to bring said machined sections and said combined ridge into intimate pressure contact, laying a weld bead along said combined ridge only to form a seal weld between said pipe sections; attaching to said juxtaposed skirts a circumscribing and circumferentially clamped segmented collet having a female channel mating said juxtaposed skirts while maintaining the substantially uniform pressure contact, and releasing said substantially uniform pressure contact only after said attaching step.

4,065,847
METHOD OF FABRICATION OF A CHARGE-COUPLED DEVICE

Joseph Borel, Echirolles; Jacques Lacour, Grenoble, and Gerard Merckel, Sassenage, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Division of Ser. No. 538,168, Jan. 2, 1975, Pat. No. 4,019,247.
This application Aug. 30, 1976, Ser. No. 718,461
Claims priority, application France, Jan. 4, 1974, 74.00294
Int. Cl.[2] B01J 17/00
U.S. Cl. 29—578 1 Claim



1. A method of fabrication of a charge-coupled device having one control line, comprising the steps of forming an insulating layer of a periodic series of insulating steps successively of substantial thickness and of small thickness on a doped semiconductor substrate, implanting doped regions of a doping type opposite to that of the doped substrate into the surface of the semiconductor by directing an ion beam upon said steps, said steps being employed as a mask in such a manner that the insulating steps of substantial thickness are opaque to the ion beam and that the insulating steps of small thickness are transparent to said ion beam, then depositing a metallic layer on alternate steps of substantial thickness and on the adjacent step of small thickness forming a series of electrodes separated by a space of two consecutive steps not covered with a metallic layer one of said consecutive steps being of substantial thickness and the other of said consecutive steps being of small thickness, and connecting each electrode to a control line.

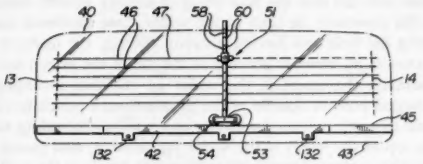
4,065,848
METHOD OF APPLYING AND REPAIRING REAR WINDOW DEFROSTER

Normand Dery, 25, Grande Fourche Nord, Sherbrooke, Quebec, Canada

Filed Mar. 19, 1976, Ser. No. 668,743
Claims priority, application Canada, Mar. 15, 1976, 247966
Int. Cl.[2] H05B 3/34
U.S. Cl. 29—611 13 Claims

1. A method for the installation of a resistive defroster on the inside surface of the rear window in a motor vehicle comprising the steps of cleaning said inside surface, applying a predetermined number of elongated parallel and equidistant heating conductors extending in a first direction, applying two connecting conductors generally transversely of said first direction and extending over the end portions of said heating conductors, said heating conductors and said connecting conduc-

tors consisting of a thin pre-glued strip of solid copper or copper alloy of uniform cross-section whose width greatly exceeds its thickness and having a layer of suitable thermo-setting adhesive over one of its wide surfaces for contacting said inside surface, said method comprising the additional steps of applying heat and pressure to said heating conductors and to



said connecting conductors in order to soften said adhesive and make a good bond between said conductors and said inside surface, soldering every crossing point of said heating conductors and said connecting conductors thereby to define a pattern of resistive lines of a predetermined resistance, and connecting said pattern across a switched supply of electrical energy.

4,065,849

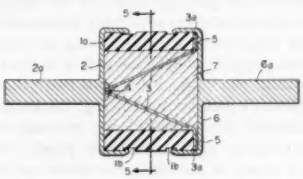
PROCESS OF MANUFACTURING ELECTRIC FUSE

Frederick J. Kozacka, South Hampton, N.H., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Division of Ser. No. 673,375, April 5, 1976, Pat. No. 4,041,525. This application Feb. 14, 1977, Ser. No. 768,107

Int. Cl.[2] H01H *69/02*

U.S. Cl. 29—623 **2 Claims**



1. A process of manufacturing electric fuses including the steps of

a. mounting a first ferrule having an inner end surface on a first rim of a casing of electric insulating material;

b. inserting a fusible element in the form of a ribbon into said casing in such a way that said fusible element in the form of a ribbon slants from the center region of said inner surface of said first ferrule to a point on the second rim of said casing;

c. establishing a solder joint between said fusible element in the form of a ribbon and said first ferrule at said center region of said inner end surface thereof;

d. filling said casing with a granular arc-quenching filler;

e. applying solder to said fusible element in the form of a ribbon at a point thereof engaging said second rim of said casing;

f. mounting a second ferrule having an inner end surface on said second rim on said casing; and thereafter

g. heating said second ferrule from the outside thereof to cause fusion of said solder and formation of an internal solder joint between said second ferrule and said fusible element in the form of a ribbon.

4,065,850

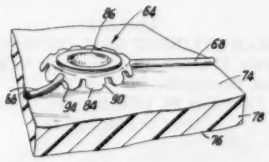
METHOD OF MAKING MULTI-WIRE ELECTRICAL INTERCONNECTING MEMBER HAVING A MULTI-WIRE MATRIX OF INSULATED WIRES MECHANICALLY TERMINATED THEREON

Robert Page Burr, Huntington; Ronald Morino, Sea Cliff, and Raymond J. Keogh, Huntington, all of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Aug. 13, 1975, Ser. No. 604,204

Int. Cl.[2] H05K *3/10;* **H01R** *43/00*

U.S. Cl. 29—625 **5 Claims**



1. A method of mechanically terminating the insulated wires of a multi-wire electrical interconnection circuit member, comprising the steps of:

scribing wires on the circuit member to form a multi-wire matrix;

selecting positions in the multi-wire matrix where an electrical connection is desired;

gripping the insulated wires of the multi-wire matrix and said circuit member at each successive selected position with a gripping member to lock said gripped insulated wires to said circuit member and to prevent movement thereof;

applying sufficient gripping force to the multi-wire matrix and said circuit member at each successive selected position to provide individual gas-tight electrical connections between said gripping member and said insulated wires; and

permanently maintaining the applicaton of sufficient gripping force to said gripping member for providing permanent gas-tight electrical connections at the selected positions of the multi-wire matrix.

4,065,851

METHOD OF MAKING METALLIC SUPPORT CARRIER FOR SEMICONDUCTOR ELEMENTS

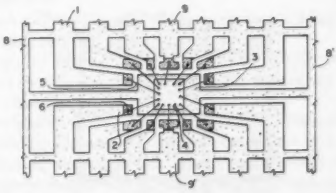
Franz Kummer, Rodenbach; Gerhard Mai, Bruchkobel; Rolf Ruthardt, Hanau, and Horst Thiede, Rossdorf, all of Germany, assignors to W. C. Heraeus GmbH, Hanau, Germany

Division of Ser. No. 560,532, March 20, 1975, Pat. No. 4,027,326. This application Nov. 3, 1976, Ser. No. 738,615

Claims priority, application Germany, Apr. 20, 1974, 2419157

Int. Cl.[2] H01R *9/00*

U.S. Cl. 29—630 R **7 Claims**



1. Method to make a metallic carrier for semiconductor elements and to form attachment terminals for lead wires for connection to the semiconductor structure comprising

forming a metal substrate with contact fingers;

screen printing on at least one contact finger of the metal

substrate at discrete bonding positions thereon, a paste comprising a bonding metal in finely distributed form in an organic evaporative carrier;

heat treating said substrate with said printed paste thereon to eliminate said carrier;

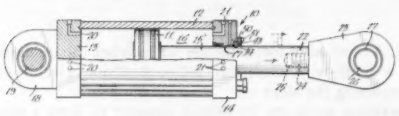
and further heat treating the remainder of said paste from which the carrier was eliminated, and the substrate, at a temperature sufficiently high to effect diffusion of said bonding metal with the contact finger of said substrate to form an electrical and mechanical bond in form of a diffusion zone and to convert the bonding layer material of said discrete positions to a spongy, microporous structure.

4,065,852

NUCLEAR CYLINDER SEAL CONSTRUCTION

John F. Bowbin, Elmhurst, Ill., assignor to Miller Fluid Power Corporation, Bensenville, Ill.

Filed July 16, 1976, Ser. No. 705,946
Int. Cl.[2] F16C *33/72*
U.S. Cl. 308—3.5 **15 Claims**



1. In a device having a cylinder tube, a piston longitudinally movable in said tube, a head extending across one end of said tube and having a through bore, a piston rod extending from said piston outwardly through said bore, and primary seal means movably sealing said piston rod to said head, improved readily removable back-up seal means for further movably sealing the piston rod to said head, comprising:

a bushing having a through bore;

means for separably securing the bushing to said head with said piston rod extending coaxially outwardly from said head through said bushing bore; and

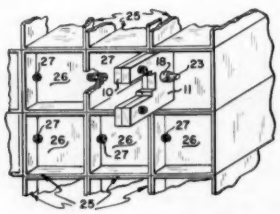
a split annular back-up seal disposed between said bushing and said head, said bushing being constructed to be selectively spaced from said head on said piston rod to expose said back-up seal for selective removal and installation thereof transaxially of said piston rod, said back-up seal being radially constricted to define an effectively closed ring slidably sealingly engaging said piston rod.

4,065,853

PORTABLE PUNCH AND DIE JIG

Edward F. Lewandowski, Westmont, and Petrus A. Anderson, Palos Heights, both of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 27, 1977, Ser. No. 763,169
Int. Cl.[2] B26F *1/00*
U.S. Cl. 30—361 **1 Claim**



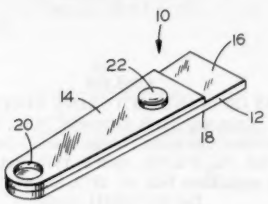
1. A punch and die jig for use in punching holes in the walls of rectangular tubes at precisely determined locations comprising two flat, congruent, U-shaped jig members of width just sufficient to fit in the tube without forcing, one of said jig members being thicker than the other, the thicker member having a cut-out portion on the inner face thereof extending across the member and extending deep into the member, means for holding the two jig members together, thereby creating a deep slot in the base of the jig, a punch and die assembly disposed in a hole in the base of the jig, which hole communicates with the slot, the hole being of slightly greater diameter in the narrower jig than in the wider, case hardened inserts lining the hole and having a cavity therein, the insert in the narrower jig member serving as the die of the punch and die assembly, the insert in the wider jig member including an enlarged portion outside of the jig member, a punch having a head movable within the cavity and a stem protruding above the top of the insert in the wider jig member, said punch and die when actuated cooperating to punch a hole in the wall of a tube interposed between the punch and the die.

4,065,854

DIMENSIONAL GAUGING APPARATUS

Donald M. Reed, 49 Mountain Road, Tariffville, Conn. 06081

Filed Sept. 29, 1976, Ser. No. 727,766
Int. Cl.[2] G01B *3/30*
U.S. Cl. 35—168 R **5 Claims**



1. A dimensional gauging apparatus for setting a gap between two opposed objects adjustably positionable relative to one another comprising: a blade having an elongated shape between two opposite blade ends and in at least one section thereof adjacent one of the blade ends two generally parallel surfaces defining a predetermined gauge thickness corresponding to the desired dimension of a gap between the adjustably positionable objects, at least one of the parallel surfaces being situated in a recess of the blade, the recess having a size and shape selected to loosely receive one of the objects whereby the blade is captured in the gap between the objects by the recess within a limited range of gap adjustment of the objects from the predetermined gauge thickness and the blade in the captured position can topple due to the weight of the blade distributed between the opposite blade ends as the gap adjustment is made greater than the predetermined gauge thickness.

4,065,855

STRUCTURAL COMBINATION FLANGE GAUGE

Norman O. Coe, 1535 Marburg Way, No. D-11, San Jose, Calif. 95133

Filed Nov. 27, 1974, Ser. No. 472,110
Int. Cl.[2] B23Q *17/00*
U.S. Cl. 33—174 R **9 Claims**

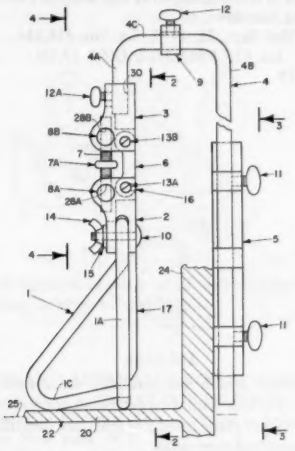
1. A layout gauge for laying out a flange of structural steel beams and the like comprising,

a tripod-type base member for three point support thereof upon the web of a structural beam,

an inverted generally U-shaped stem bar having inner and outer leg portions connected by an intermediate portion adapted to extend over a flange of a structural beam upon which the base member is supported,

means for securing the inner leg portion of the stem bar to the base member,

a gauge member for use in marking off the beam flange, and



means for securing the gauge member to the outer leg portion of the stem bar for use in marking off the beam flange.

4,065,856

MAINTENANCE MACHINES FOR RAILWAY TRACK

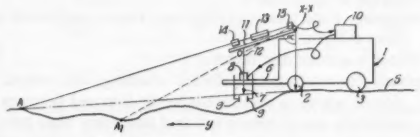
John M. Waters, Derby, England, assignor to British Railways Board, London, England

Continuation of Ser. No. 469,719, May 14, 1974, abandoned. This application May 4, 1976, Ser. No. 683,139

Claims priority, application United Kingdom, May 23, 1973, 24637/73

Int. Cl.[2] E01B *29/04*

U.S. Cl. 33—287 **10 Claims**



1. a movable optical system for establishing a reference datum in relation to the surface of a roadway, comprising:

a. a vehicle movable along a roadway,

b. a support mounted on the vehicle and pivotable about a substantially horizontal axis extending transversely of the vehicle at a predetermined height,

c. light emitting means mounted on said support and oriented to emit a beam of light along a first optical axis extending away from the pivotal axis of the support,

d. light receiving means mounted on said support and spaced from said light emitting means and oriented to detect light along a predetermined second optical axis which converges with said first optical axis in a direction extending away from said pivotal axis of the support,

e. an actuator mounted on the vehicle for adjusting the support about its pivotal axis whereby the said first and second optical axes can be caused to intersect at the surface of the roadway such that said receiving means receives along said second optical axis light from said beam reflected from the roadway, whereby an optical triangle is established, one corner of which is at the intersection if said first and second optical axes, and

f. a device mounted on the vehicle spaced a constant horizontal distance from said horizontal axis and adapted to be adjusted vertically to maintain a predetermined vertical relationship with the plane of said optical triangle.

4,065,857

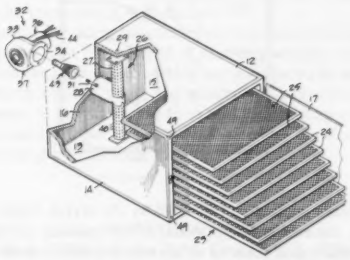
DEHYDRATOR AND METHOD FOR DEHYDRATING FOODSTUFFS

Lawrence B. Nelson; Stuart A. Mott, both of Napa, and Ray T. Flugger, Petaluma, all of Calif., assignors to Sunfresh Products, Napa, Calif.

Filed Oct. 22, 1975, Ser. No. 624,967

Int. Cl.[2] F26B *3/04*

U.S. Cl. 34—30 **22 Claims**



1. A dehydrator comprising

an enclosure having horizontally disposed top and bottom walls and vertically disposed side walls defining a substantially closed drying chamber therein,

door means movably mounted on a front side of said enclosure for normally closing said chamber and openable for exposing said chamber for depositing foodstuffs therein,

separate tubular manifold means disposed entirely in said chamber and having walls, separate from the walls defining said enclosure, defining an air inlet passage therein, said manifold means comprising a vertically disposed outlet conduit secured within said enclosure and extending between said top and bottom walls and an inlet conduit secured to said outlet conduit,

means formed through the walls of said manifold means for communicating air from said inlet passage to said chamber,

fan means connected to said inlet conduit for pumping ambient air to said inlet passage, and

heating means for heating the ambient air pumped to said inlet passage to a predetermined temperature level.

4,065,858

INSTRUCTIONAL APPARATUS WITH ELASTIC SHEET

James Richard Harte, 10 W. Concord, Kansas City, Mo. 64112

Filed Aug. 16, 1976, Ser. No. 714,315

Int. Cl.[2] G09B *3/08*

U.S. Cl. 35—9 R **9 Claims**

1. An instructional apparatus comprising: a holding mechanism provided with an upper surface having

a plurality of holes therein of substantial depth; a printed format having openings therethrough indicating

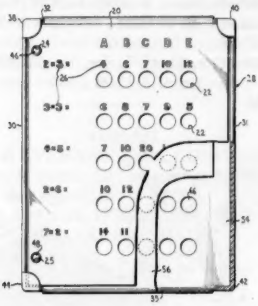
answer choices,

said mechanism having means engageable with said format for holding the same on said upper surface in overlying relationship thereto with at least certain of said openings in alignment with corresponding holes in said upper surface, said openings and said holes being adapted to receive a stylus, finger or the like used by a student to make answer selections;

a sheet of rubber-like material sandwiched between said format and said upper surface and having a normal, planar disposition, said sheet being capable of substantial deflec-

tion into an individual hole when said stylus, finger or the like is inserted thereinto through the corresponding aligned opening; and

means maintaining said sheet in a taut, resilient condition over said holes in the surface whereby, upon removal of



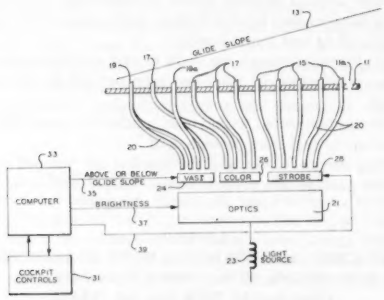
pressure applied to the sheet by the stylus, finger or the like, the rubber-like material at the opening springs back to return said sheet to its normal disposition with no permanent deformation, the quality of resistance thus presented providing an instantaneous response feedback.

4,065,859

VISUAL DISPLAY APPARATUS

Richard A. Mecklenborg, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Sept. 13, 1973, Ser. No. 397,147
Int. Cl.[2] G09B *9/08;* B64G *7/00*
U.S. Cl. 35—12 N **19 Claims**



9. A lighted model for use with a simulator comprising, in combination:

a base member having a first surface and a plurality of holes extending from said first surface through said base member;

a plurality of optical fibers each having a longitudinal axis, an input end and an output end, the output end of each of said fibers extending through a respective one of said holes in said base member, each output end comprising a polished flat surface ground at an angle relative to the axis of said fiber at said output end to provide substantially total internal reflection of light and projection of light from the output end of said fiber in a predetermined direction; and

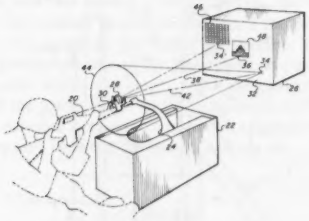
illumination means for supplying light to the input end of each of said fibers.

4,065,860

WEAPON TRAINING SIMULATOR

John D. Linton, Palatine; Samuel P. Willits, and William L. Mohan, both of Barrington, all of Ill., assignors to Spartanics, Ltd., Rolling Meadows, Ill.

Filed Sept. 22, 1975, Ser. No. 615,414
Int. Cl.[2] F41J *5/02;* G09F *11/04*
U.S. Cl. 35—25 **37 Claims**



25. A simulator which automatically determines the intersection point of a line with a target plane comprising

at least one target plane having at least one identifiable target scene associated therewith,

radiation source means,

sensor array means adapted to provide output signals indicative of the position of said radiation source means thereon,

optical means adapted to image said radiation source means on said sensor array means, said optical means comprising partially reflecting focusing reflector means and having an optical axis movable with respect to said target plane and which defines said line, said line intersecting said target plane at a point, and

circuit means connected and responsive to said sensor array means output signals and comprising position detection means to provide position data for the point of intersection of said optical axis and said target plane.

29. A scanning radiation source comprising

radiation source means,

stationary plate means having one or more rectilinear apertures therein,

slotted scanning disc means,

means for rotating said slotted scanning disc means, said slotted scanning disc means being disposed between said radiation source means and said stationary plate means to provide repetive linear moving strips of radiant energy, said slots being arcuate and being generated about points lying substantially on the two axes of said rectilinear apertures and their intersection with radial lines perpendicular thereto and extending from the center of disc rotation.

4,065,861

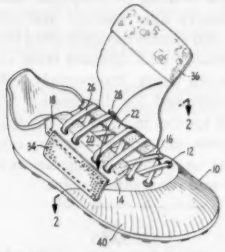
FOOTBALL PUNTING SHOE

Raymond H. Pelfrey, 1595 Howard Drive, Sparks, Nev. 89431

Filed July 30, 1976, Ser. No. 709,966
Int. Cl.[2] A43B *5/00*
U.S. Cl. 36—133 **7 Claims**

1. A football punting shoe comprising a shoe having an instep portion characterized by the presence therealong of a longitudinal foot instep highline when a foot disposed therein is arched to a ball-impacting position, a pair of ball-impacting elements attached to said instep portion, one at each

side of said highline, said elements having aligned planar upper ball-impacting surfaces extending laterally from said instep



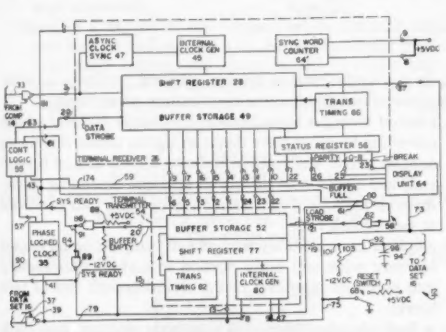
portion and disposed at the level of said highline in tangential, non-overlying relation to said highline.

4,065,862

METHOD AND APPARATUS FOR SYNCHRONIZING DATA AND CLOCK SIGNALS

Russell L. Meyer, Phoenix, Ariz., assignor to American Express Company, New York, N.Y.

Filed Sept. 15, 1975, Ser. No. 613,249
Int. Cl.[2] G06F *13/02*
U.S. Cl. 364—200 **20 Claims**



1. In a data transmission computer system having a computer for generating data signals and a local data set having means for transmitting the data signals to a remotely located data set over a transmission line which interconnects said local data set and said remotely located data set, said local data set having means for providing recurring clock pulses at a clock output thereof, an arrangement for synchronizing the data signals with the clock pulses, comprising:

a receiving register coupled to an output of said computer for receiving and storing the data signals generated by the computer, said receiving register including status means for providing a status signal whenever said receiving register is storing a given number of said data signals;

synchronizing means for providing clock signals for application to a clock input of said receiving register to enable said receiving register to store the data signals, said synchronizing means having first means coupled to said clock output of said local data set, and being responsive to the clock pulses provided by said local data set to provide first and second timing pulses related in frequency to the frequency of said clock pulses, and second means having an input connected to an output of said first means to receive said first timing pulses, and a further input coupled to said output of said computer for receiving said data signals, said second means being responsive to said first timing pulses and to said data signals to provide said clock signals whereby the data signals are synchronized with the clock pulses as the data signals are stored in said receiving register;

a transmitting register coupled to the output of said receiving register for receiving the data signals from said receiving register and for storing the data signals;

means coupling the output of said transmitting register and a data input of said local data set;

control logic means having an input connected to an output of said status means to receive said status signal and further input connected to a further output of said first means to receive said second timing pulses, said control logic means being responsive to said status signal and said second timing pulses to provide transfer signals for effecting the transfer of the data signals from the receiving register to the transmitting register; and

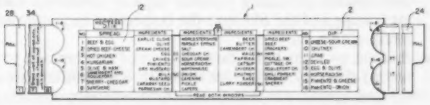
means for extending the clock pulses provided by said local data set to a clock input of said transmitting register to cause the data signals, which are transferred to said transmitting register under the control of said control logic means, to be transferred from said transmitting register to the local data set at a rate determined by the clock pulses provided by said local data set.

4,065,863

MENU PLANNER

Roy Burgess, 25 Grey Oaks Road, Carmel, N.Y. 10512

Filed Oct. 13, 1976, Ser. No. 731,548
Int. Cl.[2] G09F *11/00*
U.S. Cl. 40—490 **11 Claims**



1. A menu-planner, comprising a jacket element in form of an elongated sleeve bounding an interior space and having axially spaced open ends and an exposed outer surface provided with a first window and with two elongated substantially parallel second windows; first indicia means on said surface, including a list of consecutively numbered recipes and two pair or ingredient lists, the lists of each of said pairs flanking a respective one of said second windows along opposite lateral sides thereof with the ingredients of each list being arranged seriatim along the length of the respective window; means comprising at least two slide members each movable in said space relative to said windows longitudinally of said sleeve to a plurality of positions in each of which a portion of the respective slide member is exposed outside said space; and second indicia means on said movable means and indicative of recipe numbers, proportions of said ingredients and instructions for preparation of the respective recipe so that, upon movement of the respective slide members to a position in which a selected recipe number appears in said first window, indicia indicative of the proportions in which respective ones of said ingredients are required for the selected recipe will appear in said second windows opposite the required ingredients and preparation instructions will become exposed on said portion of said movable means outside said space and adjacent said surface.

4,065,864

STAMP STOCK SHEET

William Joseph Stanley, Brantford, Canada, assignor to 234966 Wholesale Ltd., Paris, Canada

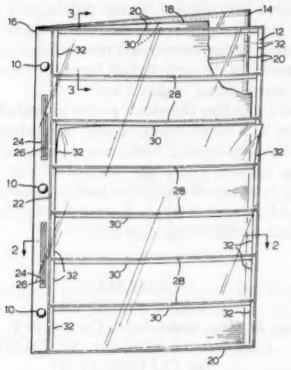
Filed Oct. 4, 1976, Ser. No. 729,026
Int. Cl.[2] G09F *7/00*
U.S. Cl. 40—405 **6 Claims**

1. A stock sheet for stamp albums and the like comprising:

a. a sheet of opaque material for written records having two

opposite record-receiving surfaces and having at least one opening therein adjacent to one edge thereof;

b. two sets each of a pair of parallel juxtaposed transparent sheets of flexible material heat-seal-joined to one another along joint lines at their edges and also along other joint lines to form a plurality of corresponding enclosures bounded on all sides by joint lines, the two sets having the record sheet sandwiched between them, so that each said record receiving surface is visible through the respective set;



c. the outer one of each said pair of sheets of a set having cut lines therein extending therethrough to constitute entries for stamps and the like into the respective enclosure to be retained therein;

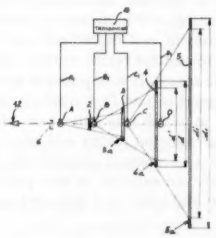
d. the said two sets being fastened to one another and to the record sheet by being heat sealed to one another through the said aperture in the record sheet, whereby the sets are hingedly connected to the record sheet to permit movement of the sets away from the record sheet and thereby viewing of the stamps and the like through both the outer sheet and the inner sheet.

4,065,865

DEVICE FOR VISUALLY DISPLAYING LUMINOUS PATTERNS

itephan Chovan, Caluire, France, assignor to Societe Cyberson, Lyon, France

Filed Aug. 2, 1976, Ser. No. 710,634
Claims priority, application France, Aug. 1, 1975, 75.24753
Int. Cl.[2] G09F *13/00*; F21P *1/02*
J.S. Cl. 40—444 **9 Claims**



1. A device for visually displaying luminous patterns, comprising:

a multiplicity of *n* light sources radiating in a direction away from a predetermined observation point, said sources being spaced apart in said direction and located on a common axis; and

screen means forming a plurality of light-receiving zones viewable from said observation point, said zones being spaced apart in said direction and staggered transversely thereto for illumination by light from different combinations of said sources,

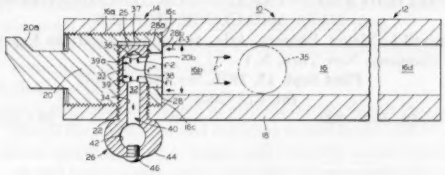
said screen means forming (*n*-1) opaque shields interposed between successive light sources, and centered on said common axis, said shields having widths transverse to said direction increasing with distance from said observation point, said zones being transversely offset from said shields and positioned for illumination by light from a number of said sources increasing with distance from said observation point, said zones including rings centered on said axis having inner and outer diameters increasing with distance from said observation point.

4,065,866

MUZZLE LOADING FIREARM

Julian Eguizabal, Eibar, Spain, assignor to Pioneer Products, Inc., Old Saybrook, Conn.

Filed Dec. 23, 1976, Ser. No. 753,649
Int. Cl.[2] F41C *21/00*
U.S. Cl. 42—51 **12 Claims**



1. In a muzzle loading firearm adapted to fire a powder charge contained therein, the combination comprising:

a. a barrel having a breech end and a muzzle end and a bore extending longitudinally therethrough to define therein an annular barrel wall, said bore being closed at said breech end, said barrel wall having an aperture extending therethrough radially of said barrel and opening into said bore at said breech end;

b. a bolster having a body portion and being mounted in said aperture with said body portion extending transversely into said bore interiorly of the closed breech end of said barrel;

c. a flash chamber formed in said body portion, said flash chamber being disposed within and opening into said bore and being adapted to receive a powder charge therein, said flash chamber being defined in part by an end wall of said body portion, which end wall is spaced from said aperture transversely of said bore whereby said flash chamber is disposed in alignment with and between said aperture and said end wall; and

d. a flash transfer orifice in said bolster which orifice communicates said flash chamber exteriorly of said barrel to provide a path for transmission of a flash from exteriorly of said barrel to said flash chamber.

4,065,867

LOCK FOR RIFLE

Dale A. Storey, 1764 S. Wilson, Casper, Wyo. 82601

Filed Dec. 6, 1976, Ser. No. 747,776
Int. Cl.[2] F41C *19/00*
U.S. Cl. 42—69 R **6 Claims**

1. A lock for mounting on a muzzle-loading caplock weapon comprising in combination:

a lock plate having an opening extending therethrough,

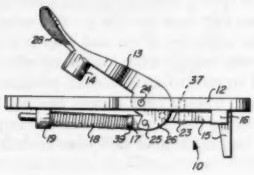
a hammer pivotally mounted on said plate and arranged to move laterally to and from one plane surface thereof,

one end of said hammer comprising a projection extending through said opening in said plate for engaging with a sear mounted on the other plane surface of said plate,

the other end of said hammer being provided with a nose selectively engagable with a percussion cap mounted on a nipple on the weapon,

spring means mounted on said other plane surface of said plate and arranged to extend between a fixed point on said plate and said one end of said hammer whereby a given pivotal movement of said hammer compresses said spring means,

a sear pivotally mounted on said other plane surface of said plate and biased into engagement with said projection of said hammer, and



lock means mounted on said sear for detachably engaging said projection of said hammer when said hammer is moved laterally away from said one plate surface of said plate,

said lock means comprising a bolt threadably mounted to extend through said sear and engageable with an indentation in said protrusion of said hammer to detachably engage therewith,

whereby a trigger of the weapon when actuated engages said sear, dislodging said lock means of said sear from said protrusion causing said spring means to rotate said one end of said hammer toward said plate causing said nose to engage the percussion cap on the nipple of the weapon.

4,065,868

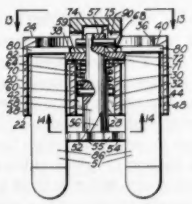
REVOLVER SPEED LOADER

David A. Johnson, 5245 Sturdivant, Klamath Falls, Oreg. 97601

Filed Nov. 5, 1976, Ser. No. 739,087

Int. Cl.[2] F42B *39/04*

U.S. Cl. 42—89 **8 Claims**



1. A device for the rapid simultaneous loading of a plurality of cartridges, each having a circular flanged peripheral edge at the base thereof, into a revolver having a cylinder with plural loading chambers, comprising:

a. a body member having front and rear opposing surfaces, and means defining a center bore extending generally perpendicularly to said front and rear opposing surfaces and a plurality of cartridge-receiving bores radially distributed around said center bore, each of said plurality of bores extending parallel to said center bore and having a diameter greater than that of said flanged peripheral edges of said cartridges and suitable for receiving and supporting one of said cartridges;

b. cartridge locking means mounted in said center bore adjacent said rear surface of said body member for releasably securing said cartridges in said plurality of bores and urging said cartridges radially inward toward said center bore; and

c. cartridge lateral support means mounted in said center bore forwardly of said cartridge locking means for releasably urging said cartridges radially outward against said inward urging of said locking means and thereby centrally positioning each said cartridge within its respective bore in parallelism with said center bore.

4,065,869

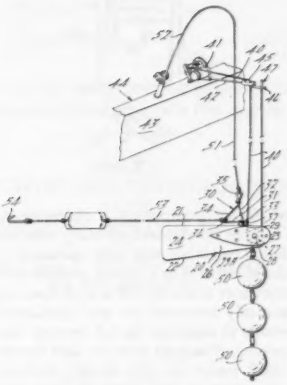
FISHING DOWN-RIGGER VANE AND RELEASE

Arthur E. Berry, Lathrup Village, Mich., assignor to Madeline E. Berry, Lathrup Village, Mich.

Filed Nov. 8, 1973, Ser. No. 413,875

Int. Cl.[2] A01K *91/00*

U.S. Cl. 43—43.12 **16 Claims**



1. A combination trolling vane and fish-line release for down-rigging a fish-line for deep water trolling comprising,

a vane having a nose, tail, top, and bottom;

attaching means adjacent said nose for securing a cable to lower the vane in the water,

attaching means on said bottom adjacent said nose for attaching a weight to sink said vane in the water,

said tail thereby trailing said cable and weight attaching means to steer said vane nose-first through the water;

a release device for integration with a down-rigger for releasably sinking a fish-line with heavy weight and trailing a bait, comprising,

a leg having opposite ends equipped with attaching means for positioning said leg axially in tension between opposite forces in a hook-up,

a prong on said leg lying substantially normal to said leg so as to lie substantially axially transverse to the tension axially exerted on said leg;

said prong having a cantilevered outer end;

a spring arm on said leg;

said spring arm having a looped outer end transversely engaging said cantilevered outer end of said prong;

said leg, prong, and spring arm thereby forming an enclosure for retaining a ring on said prong;

a ring interconnecting said vane and said prong;

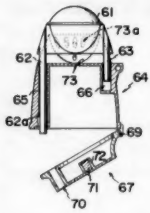
said spring arm on said leg triangulating from a point on said leg remote to said prong to its said looped outer end engaging said prong at its said outer end;

tension transferred to said spring arm from said leg being resisted by the transverse engagement between said looped end of said spring arm and said cantilevered end of said prong with the tension pulling them together in a direction transverse to the axis of said prong thereby urging them into interconnected relationship preventing escape of a ring from said enclosure;

said spring arm being torsionally elastic to flex to locate its said looped outer end outwardly of said cantilevered end

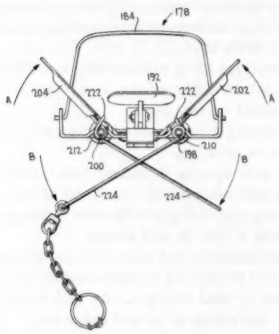
of said prong to provide an open space therebetween to permit the exit of a ring from said enclosure.

4,065,870
FISH-FEEDER
Sakae Muko, 515, Kamitsutsui, Oonojo, Fukuok, Japan
Continuation-in-part of Ser. No. 595,245, July 11, 1975, Pat. No. 4,017,999. This application Dec. 15, 1976, Ser. No. 750,781
Int. Cl.[2] A01K *97/02*
U.S. Cl. 43—44.99 **10 Claims**



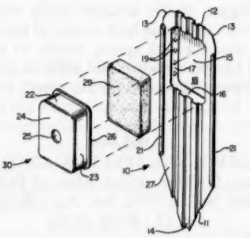
1. A fish feeder comprising a container having an open bottom, a bottom lid element pivotally mounted on said container such that bait is adapted to be contained in said container when the lid element is in a closed position and to be released from the container when the lid is in an open condition, a float element movably mounted on said container, and operable means operable to maintain the lid element closed and to provide for opening of said lid element, said operable means comprising a shaft means on one of said elements and a recess means on the other of said elements, said shaft means being mated with said recess means to maintain said lid element in said closed condition, said float element being connected to one of said means and being operable to unmate said shaft means and recess means to thereby open said lid element.

4,065,871
LOW IMPACT ANIMAL TRAP
Herbert H. Loeffler, Cambridge, Mass., assignor to Woodstream Corporation, Lititz, Pa.
Filed Feb. 23, 1976, Ser. No. 660,387
Int. Cl.[2] A01M *23/24*
U.S. Cl. 43—88 **2 Claims**



1. In an animal trap of the leghold type having a base, a pair U-shaped coacting jaws swingably mounted on said base, spring means biasing said jaws to a closed position, and trigger means for locking said jaws in an open position until released, the improvement comprising means for reducing the impact of said jaws when they close without significantly reducing the closing speed or holding power, said base being elongated and having upstanding first and second ears at the ends thereof; said jaws each comprising a pair of substantially parallel spaced legs and a cross member, said legs terminating in laterally outwardly directed pintles journalled through said bores in said ears; setting lever means pivoted on said base and having an eye which is engaged with opposed legs of said jaws; said spring means being a coil spring tensioned between said setting lever means and said base to urge said jaws to a closed position; said impact reducing means comprising an inertial snubber having a crank portion and an arm portion, said crank portion being arranged to be in contact with the upper surface of said lever and to rotate about an axis coaxial with that of said lever and said coil spring, said arm of said snubber being arranged to rest between said base and the ground when the trap is in the set position, whereby when said trap is sprung, said snubber absorbs excess energy from said lever which is driven by said spring and rotates to a depending position from said axis of rotation and transmitting excess energy to the trap itself, thereby utilizing the mass of the trap to dampen the spring, said lever then lagging behind said jaws in their travel.

4,065,872
RECEPTACLE FOR INSECTICIDE OR REPELLENT
Phillips E. Patton, Baton Rouge, La., and Norman A. Freeman, Fullerton, Calif., assignors to VCA Corporation, Baton Rouge, La.
Filed June 14, 1976, Ser. No. 695,419
Int. Cl.[2] A01M *1/20*
U.S. Cl. 43—131 **2 Claims**



1. An insecticide or repellent holding device comprising: an elongated support means having a generally planar surface adjacent its upper end; a recessed area being provided on one side of said planar surface; an insecticide container received in said recessed area; said recess and said container both being generally rectangularly shaped and said container having a rear wall connected to sidewalls which have a depth greater than said recess, a portion of which sidewalls are received in said recess; and said recess being defined by opposed pairs of interconnected sidewalls connected to a planar bottom wall, at least one pair of sidewalls being provided with inwardly extending protrusions, the corresponding sidewalls of said container being provided with outwardly turned edges adapted to be engaged by said protrusions to secure said container within said recess.

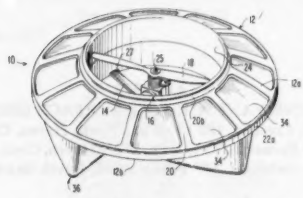
4,065,873
FLYING SAUCER TOY
Robert Alexander Jones, 23405 Caminito Telmo, Laguna Hills, Calif. 92653
Filed Aug. 30, 1976, Ser. No. 718,998
Int. Cl.[2] A63H *27/12*
U.S. Cl. 46—75 **10 Claims**

1. A toy flying saucer comprising:
an annular body, said annular body being generally frustoconical in cross section including upper and lower radial walls converging in a radially outward direction and joined at their radially inner ends by a sidewall which

extends generally vertically therebetween and which defines an axial opening therein,

motor support means spanning said opening and fixed to said body at circumferentially spaced positions,

a motor mounted on said support means and having a drive shaft disposed along the vertical axis of the body,



propeller means fixed to said shaft for rotation at right angles to the shaft axis to create air flow downwardly through said opening to lift the body vertically upward, and

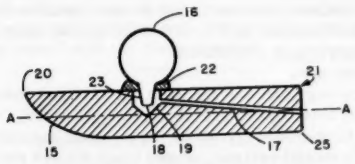
a plurality of circumferentially spaced tetrahedron shaped fins extending outwardly from the lower wall of said body, radially outside of said body opening and pitched opposite to said propeller means.

4,065,874

CARTESIAN TOY SUBMARINE

Hubertus R. Ross, 7601 Salem Church Road, Richmond, Va. 23234

Filed June 2, 1977, Ser. No. 802,850
Int. Cl.[2] A63H *23/06*
U.S. Cl. 46—94 **5 Claims**



1. A toy submarine comprising an elongated cylindrical hull having a bow configuration streamlined to minimize resistance to forward motion through a liquid medium and a stern portion which tapers to a vertically disposed terminus as a result of the convergence of two essentially vertically disposed opposing surfaces, a rigid air-holding chamber substantially centrally positioned on the upper portion of said hull, said chamber having an aperture in a lower portion thereof located within said hull, and a straight cylindrical channel within said hull communicating with said chamber and emerging from one of said opposing surfaces, said channel having a downwardly angled orientation in going from said chamber to said surface.

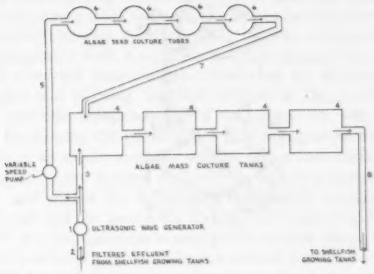
4,065,875

SELECTIVE DESTRUCTION OF CERTAIN ALGAE

Richard Frank Srna, Milton, Del., assignor to University of Delaware, Newark, Del.

Filed Sept. 17, 1976, Ser. No. 724,411
Int. Cl.[2] A01G *9/00*
U.S. Cl. 47—1.4 **1 Claim**

1. In a process for the culture of Thallasiosira algae cells for use as a nutrient for feeding of shellfish, the improvement which comprises passing the culture liquid containing the Thallasiosira through a zone in which ultrasonic waves of the


ALGAE SEED CULTURE TUBES
VARIABLE SPEED PUMP
ALGAE MASS CULTURE TANKS
ULTRASONIC WAVE GENERATOR
FILTERED EFFLUENT FROM SHELLFISH GROWING TANKS
TO SHELLFISH GROWING TANKS

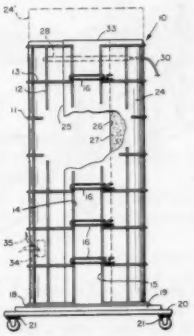
order of 20,000 cycles per second are generated in order to destroy any Phaeodactylum algae cells that may be present.

4,065,876

PORTABLE GARDEN AND METHOD OF PRODUCING SAME

F. Wesley Moffett, Jr., 944 Allens Creek Road, Rochester, N.Y. 14618

Filed Aug. 2, 1976, Ser. No. 710,447
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—83 **12 Claims**



7. The garden device of claim 6 and further comprising a perforated tubular member embedded within the soil adjacent the upper open end of said sleeve, and having an open end of said tubular member extending through said upper end of said sleeve for connection to a water supply for watering the soil.

4,065,877

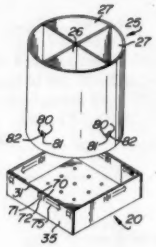
CONTAINER SYSTEM FOR PLANT HUSBANDRY

Albert W. Kelley, R.D. 1, Box 28, Creamridge, N.J. 08514

Filed Nov. 12, 1976, Ser. No. 741,470
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—85 **9 Claims**

1. A system of containers for plant husbandry comprising a plurality of generally rectangular trays each having a perforated bottom wall and side walls about said bottom wall, and a plurality of intersecting dividers removably located in certain of said trays for subdividing each of said certain trays into a plurality of relatively small growing compartments for relatively small plants, a plurality of open ended tubes each upstanding from the bottom wall of one of the remaining trays and having spaced portions proximate to the tray side walls, and additional intersecting dividers removably located in certain of said upstanding tubes for subdividing each of said cer-

tain tubes into a plurality of intermediate growing compartments for intermediate size plants, the remainder of said up-



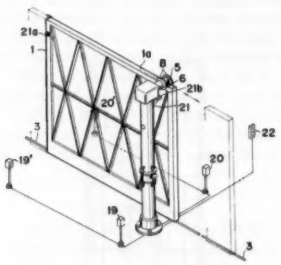
standing tubes and associated trays each defining a relatively large container for a relatively large plant.

4,065,878

AUTOMATIC DOOR OPENING AND SHUTTING DEVICE

Sachio Tsugane, 1627-28, Kamisoyagi, Yamato, Kanagawa, Japan

Filed Apr. 21, 1976, Ser. No. 678,940
Int. Cl.[2] E05F *15/14*
U.S. Cl. 49—360 **7 Claims**



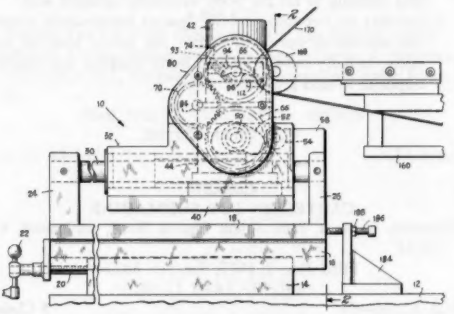
1. A device for opening and shutting a door, comprising a support having a lower tube and an upper tube vertically movable relative to the lower tube; a driving source mounted on the upper tube of the support; friction drive means for carrying out a friction drive of the door by transmitting power of the drive source and adapted to move clockwise or anticlockwise or to stop, the friction drive means having a friction wheel movable between a first position in which the friction wheel frictionally engages a friction surface of the door so that load is applied to the latter and a second position in which the friction wheel is disengaged from the friction surface of the door so that no load is applied to the latter, a pair of guide wheels for securing the friction wheel against shaking of the door caused during its opening and shutting and for thereby maintaining appropriate power transmission of the friction wheel to the friction surface, the friction wheel being disengageable from the friction surface of the door to a distance corresponding to the difference between the radii of the guide wheels and the radius of the friction wheel, and a power transmission means installed between a drive source and an output shaft for rotating the friction wheel with a given torque; means for moving the friction wheel at least from the first position to the second position in which the friction wheel is disengaged from the friction surface of the door so that no load is applied to the latter whereby to permit opening or shutting of the door by hand; guide rails for guiding a side of the door which is spaced from the friction surface thereof, during opening or shutting of the door; and stop means for stopping the opening or shutting movement of the door when a resistance force applied to the door surpasses the friction drive force transmitted by said friction wheel to the friction surface.

4,065,879

TURBINE VANE AIR-FOIL SURFACE GRINDER

Salvatore J. Cretella, 180 Fitch St., North Haven, Conn. 06473; Matthew Bernardo, 62 Lee St., West Haven, Conn. 06516, and Ralph T. DeMusis, 547 Foxon Road, North Branford, Conn. 06471

Filed May 17, 1976, Ser. No. 687,396
Int. Cl.[2] B24B *21/02, 19/14*
U.S. Cl. 51—145 R **17 Claims**



1. A machine for resurfacing in one operation both the convex and concave air-foil surfaces of turbine vanes and the like, comprising in combination:

a. a base part,

b. a carriage part movable over the base part toward and away from a work-performing station thereon,

c. an abrasive belt carried by the base part and a shaft and pully on said base part, around which the belt passes so as to present a convex cutting surface at said work-performing station, the radius of said pulley being less than the smallest radius of curvature of the concave air-foil surface of the vanes so as to admit the belt fully into the concave surface,

d. powered means for driving the belt,

e. means comprising a pair of axially aligned and axially spaced apart, independent shafts on the carriage part for rotatably mounting the opposite ends of the vane to be resurfaced and enabling the entire air-foil periphery thereof to be continuously presented for engagement with the cutting surface of the belt as the carriage part moves relative to the work-performing station,

f. a cam carried by one of said parts and turnable about an axis thereon, said axis being parallel to and non-coaxial with said axially-aligned shafts and said cam being located opposite the space therebetween,

g. a cam follower carried by the other of said parts and engaging said cam, said

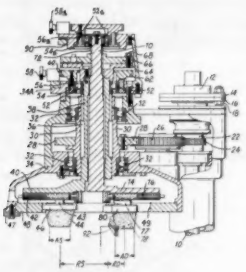
h. drive means connecting the cam and the vane mounting means to effect simultaneous synchronous rotation of the cam and the vane, whereby the resurfacing of the latter is governed by the particular contour of the cam,

i. said drive means including means connected with the aligned shafts, for gearing the same together for simultaneous turning movement.

4,065,880
SHARPENER FOR CUT-OFF HAVING A HELICAL KNIFE

Philip Arthur Maw, London, England, assignor to Molins Limited, England

Filed June 9, 1976, Ser. No. 694,320
Claims priority, application United Kingdom, June 14, 1975, 25472/75
Int. Cl.² B24B *9/00*
U.S. Cl. 51—247 **12 Claims**

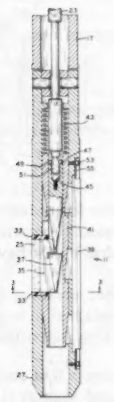


1. A cut-off mechanism for a cigarette or other similar continuous rod making machine, comprising a rotating helical knife and a sharpening device for sharpening the knife, characterised in that the sharpening device comprises two rotary sharpening members arranged to act on opposite sides of the knife, the sharpening members both being carried by a rotary member which rotates about an axis substantially parallel to the axes of rotation of the sharpening members, and each sharpening member being adjustable in regard to its distance from the axis of rotary member, at least one of the sharpening members being driven by engagement of a rim on the sharpening member with a movable drive transmitting idler wheel which is mounted for rotation about an axis spaced from that of the said sharpening member and which also engages a stationary ring coaxial with the rotary member.

4,065,881
GUIDED HONING TOOL

Robert H. Gillette, Box 313, Angola, Ind. 46703

Filed Dec. 6, 1976, Ser. No. 747,820
Int. Cl.² B24B *33/08*
U.S. Cl. 51—346 **13 Claims**



1. A honing tool having a generally cylindrical body portion with a plurality of longitudinally extending outwardly opening radial slots, an abrasive element disposed in each of a first subplurality of said slots, a like first subplurality of expander plates each carried by the body and projecting radially outwardly with the outer end portions thereof being disposed in the slots and engaging respective abrasive elements, means for selectively urging all of the expander plates and therefore also the abrasive elements simultaneously radially outwardly and into engagement with a workpiece, guide means disposed in each of a second subplurality of said slots for engaging the workpiece and aligning the tool relative to the workpiece, means operable independently of the means for selectively urging for forcing the guide means into engagement with the workpiece, an axially movable control rod, a lost motion coupling between the control rod and the means for selectively urging, and means for selectively frictionally coupling the control rod and the means for forcing, the control rod being movable in a first direction to engage and actuate the means for selectively urging, and movable in a second direction to deactuate the means for selectively urging and to frictionally engage and override the means for forcing.

4,065,882
GRINDING TOOL FITTED WITH AN ABRASIVE SHEET HAVING ACTIVE FACE AND EDGE SURFACES

Giuseppe D'Urso, Viale Strasburgo, 253, 90100 Palermo, Italy

Filed Aug. 2, 1976, Ser. No. 710,729
Claims priority, application Italy, Sept. 4, 1975, 26926/75
Int. Cl.² B24D *9/08*
U.S. Cl. 51—381 **8 Claims**

1. A rotary abrasive tool comprising:
a rotary support having a substantially flat circular lower face and a peripheral edge;
a resilient circular pad overlying said flat face and having a flat working face on the bottom thereof and a peripheral edge of substantial width;
a sheet of abrasive coated material overlying said working face and having a multiplicity of edge tabs extending upwardly over said peripheral edges, said edge tabs being configured and arranged to lie against said peripheral edge in mutual edge-abutting relation to thereby define a smooth and continuous abrasive edge surface for said tool; and
means releasably securing only the upper ends of said tabs to the peripheral edge of said support.

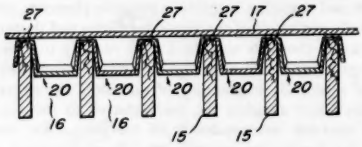
4,065,883
WATER CONDUCTING MEMBERS SPACED BETWEEN SPACED EXPOSED BUILDING SUPPORT BEAMS

Leo Thomas Thibodeau, 2638 Kirklyn St., Falls Church, Va. 22043

Filed Jan. 7, 1976, Ser. No. 647,089
Int. Cl.² E04D *13/00*
U.S. Cl. 52—11 **7 Claims**

1. A horizontal support surface comprising a plurality of spaced apart elongated beams, an elongated unitary channel member disposed in each of the spaces and being of substantially the same length as said beams and of a width substantially filling the space for conducting fluid therethrough, each of said channel members being comprised of a base, side walls extending upwardly from opposite sides of the base, said side walls tapering from a narrow portion at one end to a wider portion at the other end causing said base to slope downwardly from said one end to said other end, means securing said side walls of each channel member to the beams adjacent thereto, and

spaced apart horizontally disposed floor boards positioned transversely over and substantially covering the alternating



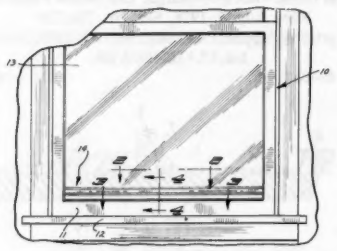
beams and channel members, and means securing the floor boards to the beams.

4,065,884

WINDOW DRIP COLLECTOR

David A. Tenquist, Edina, Minn., assignor to Novus Inc., Minneapolis, Minn.

Filed Oct. 4, 1976, Ser. No. 729,835
Int. Cl.[2] E06B *7/12*
U.S. Cl. 52—37 **8 Claims**



1. A device for collecting moisture on a vertical pane such as a window pane having an interior surface exposed to the interior atmosphere of a heated room including a housing, means to apply said housing to the window pane on the interior surface of the window pane adjacent the lower edges thereof and substantially horizontal, said housing spanning substantially the entire width of said window, a water absorbent air premeable insert in said housing, said housing having an upper wall having apertures provided therethrough opening to said insert and being exposed to ambient air in said room along the length of said housing, and said housing defining a lower opening to permit ambient air from the interior of the room to enter the housing.

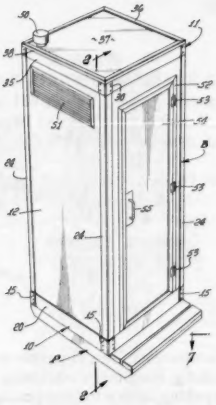
4,065,885

PORTABLE BUILDING STRUCTURE

John S. Blick, III, and Ralph N. Fuller, both of Laguna Beach, Calif., assignors to Monogram Industries, Inc., Santa Monica, Calif.

Continuation-in-part of Ser. No. 279,098, Aug. 9, 1972, abandoned. This application Feb. 1, 1974, Ser. No. 438,877
Int. Cl.[2] E04B *1/348*
U.S. Cl. 52—143 **4 Claims**

1. In a portable building comprising a base structure, a roof structure, side walls, a rear wall and a front wall having a door opening into the interior thereof, said base structure and said roof structure comprising frame members and a floor panel and a ceiling panel, respectively, each of said structures having means at the corners of said structures interconnecting said frame members, elongated corner posts of a unitary rigid non-resilient material, extending between the corners of said structures, means at the corners of said structures and on said corner posts removably connectable for interconnecting said corner posts and said structures said corner posts and said frame members having means for removably receiving wall panels in a close-fit relationship, and wall panels removably disposed between said corner posts, said means for removably receiving wall panels including elongated flanges on said corner posts and on said frame members forming panel receiving channels therebetween, said means at the corners of said structure and on said corner posts for interconnecting said corner posts and said structures comprising corner members having sockets at said corners and ends on said corner posts engaged in said



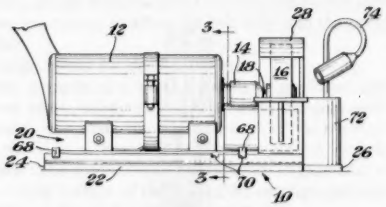
sockets in said corner members, and means adjustably interlocking said corner members and said ends for forcing said flanges on said corner posts towards said flanges on said frame members for thereby gripping said panels firmly between said flanges to form a rigid self-supporting portable building, said means for adjustably interlocking also being adapted to selectively release said panels from said flanges to thereby quickly and easily dismantle said portable building.

4,065,886

PORTABLE ABRASION TOOL

William James Harwood, Saginaw, and Robert P. Snyder, Bay City, both of Mich., assignors to William James Harwood, Saginaw, Mich.

Filed Aug. 16, 1976, Ser. No. 714,364
Int. Cl.[2] B24B *41/00*
U.S. Cl. 51—166 FB **20 Claims**



1. A portable apparatus for reducing the dimensions of a workpiece by abrading means comprising in combination:

a. a portable electric drill motor having a tool shaft-receiving chuck;

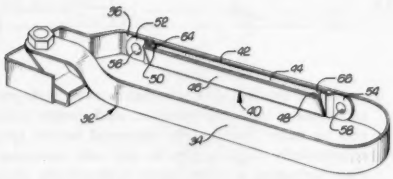
b. a rotatable workpiece abrading means operatively connected with a shaft adapted to be engaged by said chuck;

c. a guide member having supported thereon said drill motor;

d. a base member having a first end and a second end and adapted to receive and support (1) adjacent the first end thereof said guide member and (2) adjacent the second end thereof a housing adapted to generally surround at least a portion of said abrading means;

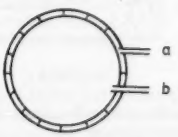
e. means for assuredly fixing each of said guide member and housing a predetermined distance along said base member;
said base member having retentive substantially parallel positioning rails extending longitudinally along each lateral edge of a face of said base member;
said guide member being slidable longitudinally of said base member between said retentive parallel positioning rails whereby the drill motor supported thereon is adjustably positionable with respect to the second end of said base member;
said housing being slidable longitudinally of said base member between said retentive parallel positioning rails; and
said base member being substantially coextensive with the combination of the guide member and the housing.

4,065,887
SOAPSTONE SHARPENER
Thomas E. Shrader, Rte. 3, Box 658B, Bakersfield, Calif. 93307
Filed Mar. 10, 1976, Ser. No. 665,660
Int. Cl.² B24D *15/00*
U.S. Cl. 51—358 **6 Claims**



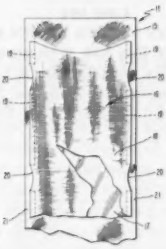
1. In a soapstone sharpener for providing a fine marking edge on the stone, said sharpener comprising:
an elongated member having facing legs forming a V-shaped cross section,
abrasive material secured on inner faces of the legs forming the V to form inner abrading surfaces of V-shaped cross section,
said elongated member having extensions on said legs at one end thereof in the elongated direction,
said extensions being in proximate relationship,
means associated with said member for attachment to carrying means, and
clip means being positioned within said extensions and extending over one end of said abrasive material to secure it in place,
whereby a soapstone may be rubbed on said abrasive material within the V to form the soapstone to be complementary to the V and to have a fine marking edge.

4,065,888
FLUID INFLATABLE SPATIALLY EXPANDABLE HOLLOW BODY CONSTRUCTION
Reinhard Hans Napierski, Hamburger Str. 1-3, Eschborn, Germany (6236)
Filed Mar. 19, 1976, Ser. No. 668,741
Int. Cl.² E04G *11/04*
U.S. Cl. 52—2 **7 Claims**



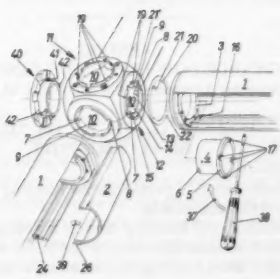
1. A spatially expandable hollow body construction adapted to be filled by a fluid to provide expansion thereof, said construction comprising a first fluid inflatable, main hollow body including an outer skin and means for enabling automatic filling of said first body by the sucking in of fluid when said skin of said first body is expanded and for preventing escape of said fluid from said main body through said filling means when the main body is expanded to the desired extent; and a second fluid inflatable hollow body connected to said first hollow body and arranged such that inflation of said second hollow body causes expansion of the skin of said first hollow body and consequent filling of said first hollow body by the sucking in of said fluid.

4,065,889
DOUBLE WALL FABRIC PANEL UNIT
Donato M. Fraioli, Mamaroneck, N.Y., assignor to Air Tech Industries Inc., Clifton, N.J.
Filed June 16, 1976, Ser. No. 696,635
Int. Cl.² E04B *1/345*
U.S. Cl. 52—2 **6 Claims**



1. A double-wall fabric panel unit having interior and exterior sides for use as wall sections in the construction of inflatable buildings, comprising, in combination, a first elongated panel of fabric having a plastic coating on the interior side thereof, and an elongated thermal liner panel having an edge strip extending along each side edge thereof attached to the plastic coating of said first panel, said thermal liner panel having a reflective metallic surface facing said first panel, each of said side edge strips beind discontinuous at intervals along the length of said liner panel to provide a plurality of spaced unobstructed air passageways to the atmosphere to vent air from between said panels when said unit is rolled.

4,065,890
FRAMEWORK JOINT
Wolfgang Fenner, Feldbergstrasse 56, 6204 Taunustein 2, Germany
Filed Dec. 8, 1976, Ser. No. 748,708
Claims priority, application Germany, Dec. 17, 1975, 2556813
Int. Cl.² E04F *19/00*; E04B *2/62*
U.S. Cl. 52—27 **13 Claims**



1. A frame comprising

a plurality of hollow rods (1,2) each of which has an inwardly directed annular flange (3) at each end;

axially displaceable and rotatable guided sleeves (4) coaxial within said hollow rods at each end, said sleeves having an outwardly extending annular flange (5) at one end for engagement behind the flanges of said tubes, said sleeves having one or more circumferentially spaced dogs radially extending at the end opposite the annular flange;

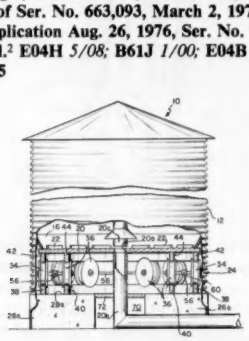
a plurality of hollow connecting members having two or more openings (10) for receiving said guided sleeves (4) associated with said tubes, said connecting members having associated with each opening a cylindrical flange (9) with circumferentially spaced guide ways (7,8) therein for receiving said dogs on said guided sleeves, such that the guided sleeve after being inserted in said opening, with dogs and guideway aligned, may be rotated placing the dogs behind the cylindrical flange thus forming a bayonet connection.

4,065,891

ROTARY FLOOR GRAIN BIN

Kermit H. Burgin, P.O. Box 334, Whitestown, Ind. 46075

Continuation of Ser. No. 663,093, March 2, 1976, abandoned.
This application Aug. 26, 1976, Ser. No. 717,603
Int. Cl.[2] E04H *5/08*; B61J *1/00*; E04B *1/346*
U.S. Cl. 52—65 **18 Claims**



1. A rotary floor comprising a base having an upwardly facing surface and defining a vertically extending center axis, a platform disposed above and in vertical registry with said base, said platform having a bottom side, in which the improvement comprises circular outer and inner lower tracks concentrically mounted on said base, circular outer and inner upper tracks concentrically mounted on said bottom side to be in vertical registry, respectively, with said lower tracks, a plurality of first wheels running on said outer lower track and under and supporting said outer upper track, a plurality of second wheels running on said inner lower track and under and supporting said inner upper track, means for driving said platform about said axis, each said first wheel being mated with one of said second wheels and spaced radially outwardly therefrom, and an axle for each mated first and second wheel, said mated wheels being rotatably mounted on said axle.

4,065,892

REMOVABLE LOW LEVEL BUILDING CARRIER

Robert Raymond Lawrence, 205 W. Fifth St., Alturas, Calif. 96101

Filed Sept. 13, 1976, Ser. No. 722,883
Int. Cl.[2] E04B *1/343*
U.S. Cl. 52—143 **1 Claim**

1. In combination, a prefabricated building and a low level building carrier comprising

a. a prefabricated building having an elongated body and which is structurally suitable for being transported upon said low level building carrier along a line parallel to the longitudinal axis of said building,

b. a low level building carrier lying beneath said prefabricated building, having ground engaging wheeled running gear for moving said building along a line parallel to the longitudinal axis of said building and comprising,

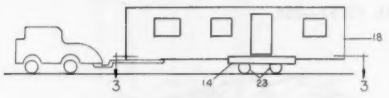
1. two longitudinally elongated flat dolly connection plates of equal length, parallel to one another and separated by a distance substantially equal to the width of said prefabricated building,

2. braced steel dolly frame including ground support wheels and comprising

a. two identical longitudinal elongated side members horizontally disposed lying transverse to the longitudinal axis of said prefabricated building,

b. two identical longitudinal elongated end nenbers horizontally disposed lying parallel to the longitudinal axis of said prefabricated building, of length substantially less than said side members,

c. two identical longitudinally elongated cross members horizontally disposed, extending between said side members, of length substantially equal to said end members and lying parallel said end members,



d. means of bracing said side members in their parallel relationship with one another, said means including one or more horizontally disposed braces lying at substantially right angles to said side members and also including one or more horizontally disposed diagonal braces, all of latter said braces being longitudinally elongated members connecting to said side members by welding, bolts, rivets or the equivalent,

e. means of connecting said cross members to ground engaging wheeled running gear spring hangers, such means being by welding or the equivalent,

f. means of connecting said dolly connection plates to said end members said means being by bolts engaging both said end plates and said dolly connection plate in a relationship placing said end members and said dolly connection plates flat against one another,

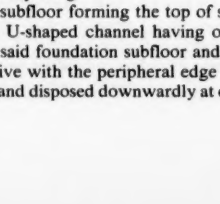
g. means of connecting said dolly connection plate to said prefabricated building such means being by lag screws or bolts engaging both said dolly connection plate and said prefabricated building when flat against one another.

4,065,893

COMPOSITE FOUNDATION FRAMING ASSEMBLY

Archie C. Epes, P.O. Box 3574, Shreveport, La. 71103

Filed Jan. 16, 1976, Ser. No. 649,667
Int. Cl.[2] E04C *2/26*
U.S. Cl. 52—169.11 **1 Claim**



1. A composite foundation framing assembly for installation on a fill support comprising:

a. a foundation subfloor forming the top of said assembly;

b. a foundation U-shaped channel having one leg beneath and adjacent said foundation subfloor and the web member co-extensive with the peripheral edge of said foundation subfloor and disposed downwardly at essentially a 90°

angle with respect to said foundation subfloor to form a portion of the sides of said foundation framing assembly;

c. a layer of expanded foam material having a density of from about two to about five pounds per cubic foot on the underside of said foundation subfloor and disposed between and beneath the legs of said foundation channel to form the lowermost member of said assembly and adapted to be in contact with said fill support; and

d. a waterproof coating extending from the top of and in continuous contact with said foundation subfloor around said peripheral edge of said foundation subfloor, across said foundation channel, and terminating under said layer of expanded foam material.

4,065,894

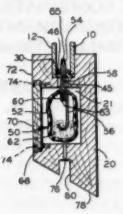
REPLACEABLE DOUBLE GLAZED WINDOW DEFOGGING APPLIANCE AND WINDOW STRUCTURE THEREFOR

Ralph K. Day, 307 W. Harrison Ave., Maumee, Ohio 43537

Continuation-in-part of Ser. No. 361,989, May 21, 1973, Pat. No. 3,932,971. This application Dec. 9, 1975, Ser. No. 639,055

Int. Cl.² E06B *7/12*

U.S. Cl. 52—171 **6 Claims**



1. In combination a pair of substantially parallel spaced apart panes of transparent sheet material; resilient gasket means disposed between the marginal edges of the facing surfaces of said panes; said gasket means having compressible faces engaging the adjacent faces to said spaced apart panes and defining an enclosed volume between the facing surfaces of said panes; a frame circumscribing the periphery of said panes said frame including elements having grooves for receiving the marginal edge of said panes to urge said panes toward one another to compress said gasket an amount sufficient to produce an airtight sealing contact between the marginal edges of the facing surfaces of said panes and said gasket means; at least one of said frame elements having a receptacle, and a passage between said receptacle and the groove of said element; said gasket means having an aperture in registry with said passage and extending to said enclosed volume; a sealed detachable container having flexible walls fitted within said receptacle and carrying a quantity of dehydrating material a rigid tube extending outwardly from said flexible walls of said container and sealingly secured to said container walls; and a means for supporting said tube with respect to said container to facilitate its manipulation through said gasket aperture; said tube extending from said container through said passage and said gasket aperture to provide gas flow communication between the interior of said container and said enclosed volume; and passage means providing communication between ambient atmosphere and said receptacle within said frame for pumping gas between said container and said enclosed volume.

4,065,895

WOOD BUILDING CONSTRUCTION

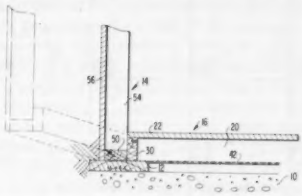
Richard S. Shank, P.O. Drawer 5603, Charlottesville, Va. 22903, and Fred H. Hermanson, Box 38, Charlottesville, Va. 22902

Filed June 23, 1976, Ser. No. 699,133

Int. Cl.² E04B *1/40*

U.S. Cl. 52—210 **8 Claims**

1. A wood building construction comprising a plurality of wood support plates adapted to be placed directly on a gravel support bed, a plurality of prefabricated rectilinear floor panels, each of said floor panels comprising a plurality of parallel spaced apart joists and a plurality of rectilinear deck boards disposed transversely of said joints and secured thereto with one end of each board only partially overlapping an outer one of said joists and the other end of each deck board extending beyond the other outer joist of said joists a distance equal to the spacing between said joists and secured to said outer one of the joists of an adjacent panel, the ends of said joists terminating



inwardly from the side edges of said deck boards a distance equal to the width of said joists, a plurality of prefabricated vertically extending rectilinear wall panels mounted on said support plates in abutting relation to said floor panels, each of said wall panels having a plurality of parallel spaced apart studs secured to top and bottom plates, an end plate secured to the bottom plate of each wall panel in abutting relation to the ends of said joists and means securing said side edges of said deck board to said end plates to connect said wall panels and said floor panels together.

4,065,896

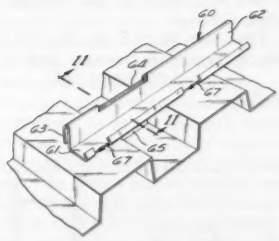
BOTTOMLESS TRENCH DUCT

John P. Penczak, Euclid, Ohio, assignor to Bargar Metal Fabricating Co., Cleveland, Ohio

Filed Mar. 21, 1977, Ser. No. 779,729

Int. Cl.² E04B *5/48*

U.S. Cl. 52—220 **15 Claims**



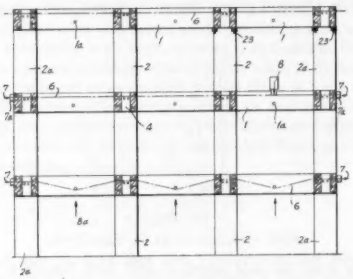
1. In an underfloor electrical distribution system, including a cellular subfloor duct assembly having crests and troughs defining raceway cells, a bottomless trench duct comprising a cover and spaced supporting side rail means fixed to said crests and running generally perpendicular thereto said cover being attached to said supporting side rail means, and individually replaceable void closure means depending from said supporting side rails into said troughs, whereby a closure means may be chosen to conform to the configuration of a particular trough and a series of closure means may conform to the spacing between troughs.

4,065,897

PRECAST SKELETON SPATIAL MONOLITHIC STRUCTURE

Branko Zezelj, Vojvode Misica 43, Belgrade, Yugoslavia

Filed July 9, 1974, Ser. No. 486,906
Int. Cl.² E04C *3/26*
U.S. Cl. 52—227 **1 Claim**



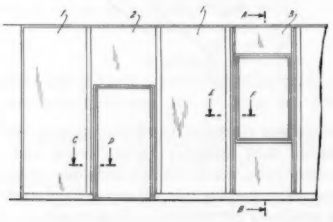
1. A skeleton precast space monolithic structure including a system of reciprocal orthogonal beams connected to a plurality of vertical columns by frontal contact between the ends of the beams and sides of the columns, comprising: said beams being formed so as to provide longitudinal interspaces, at least one transverse opening extending through each of said beams, through-holes extending through said columns in axial alignment with said beam interspaces, horizontally prestressed linear steel cables being anchored to the outermost columns of said structure and extending through the through-holes in said columns and said interspaces in said beams, means for deflecting said steel cables vertically downwardly in said interspaces to below the levels of said transverse openings in said beams so as to impart vertical forces thereto, said means including cable retaining means extending through said transverse openings; a sheet metal frame being supported proximate the upper end of each column, said frame having two bars extending vertically therefrom at opposite angles thereto, column reinforcements being connected to said bars, said bars entering apertures in said columns, and connecting agent being injected into said apertures to form a rigid fastening bond therebetween.

4,065,898

KNOCK-DOWN PARTITION WALL SYSTEM

Edmund Munk, Oberstenfeld, Germany, assignor to Furnier-und Sperrholzwerk J. F. Werz Jr. KG Werzalit Pressholzwerk, Oberstenfeld, Germany

Filed May 20, 1975, Ser. No. 579,143
Claims priority, application Germany, June 10, 1974, 2427997
Int. Cl.² E04H *1/00*
U.S. Cl. 52—241 **20 Claims**



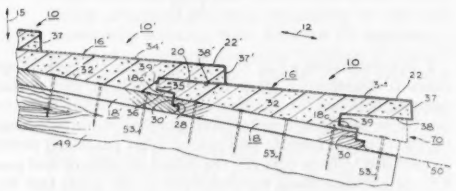
1. A knock-down partition wall system, comprising a plurality of wall elements, each having two transversely spaced profiled particle board panels, a sliver of acoustically and thermally damping material confined between said panels, sheet-material connecting members mounted on each panel adjacent respective edge portions thereof and extending towards the other panel, the connecting members of the respective panels having portions overlapping one another intermediate the panels and being fixedly connected to one another, spacing elements extending between said connecting members and having at each end bent portions engaging respective ones of said connecting members so as to provide a predetermined space between adjacent wall elements, means for bridging said space and including holding members having engaging portions hooked onto said edge portions of said panels; and securing means for releasably securing said panels to the boundary walls bounding a space which is to be partitioned.

4,065,899

INTERLOCKING COMBINATION SHINGLE AND SHEETING ARRANGEMENT

William J. Kirkhuff, 18414 S. Wilton Place, Torrance, Calif. 90504

Continuation-in-part of Ser. No. 323,278, Jan. 10, 1973, Pat. No. 3,852,934. This application Mar. 28, 1974, Ser. No. 455,618
Int. Cl.² E04D *1/28*
U.S. Cl. 52—309.8 **4 Claims**



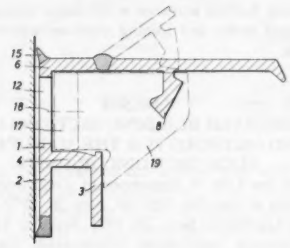
1. A composite integrated building construction member for installation on roofs, walls and other elements and comprising in combination:

an elongated construction member having top and bottom surfaces and sides and comprising a first part formed from foamed plastic material simulating a shingle and a second part comprised of a wooden sheeting member, said first part and second part being integrally bonded together throughout the elongated length thereof whereby to form a single integrated construction element adapted for securement on roofs, walls or otherwise of construction, and having lateral end sealing means along lateral edges for sealing engagement with adjacent construction members in the same course, and said lateral end sealing means comprising at least one angular shoulder one upstanding ridge and at least one extending overhang so configured that said lateral edges of adjacent composite members are adapted to be brought into juxtaposed sealing interfitting relationship; and end sealing means for sealing engagement with construction members in adjacent courses; said lateral end sealing means comprising a first end sealing means spaced a first preselected distance from a first end of said wooden sheeting member and a second end sealing means spaced a second preselected distance from the second end of said sheeting member, and said sheeting member free of said foam plastic material in said first and said second preselected distances to provide a securing area thereof in which securing members may be driven therethrough for said securement thereof.

4,065,900
PROFILE STRIP FOR FRAMING AND FASTENING SECONDARY GLAZING PANES

Frank Eggert, Hamburg, Germany, assignor to Schlegel GmbH, Hamburg, Germany

Filed Dec. 11, 1975, Ser. No. 639,798
Claims priority, application Germany, Dec. 13, 1974, 2459017
Int. Cl.[2] E04B *5/52;* **E04C** *2/00*
U.S. Cl. 52—476 **11 Claims**



1. A profile strip for framing glazing panes and fastening the panes to screw heads on a main support frame comprising:

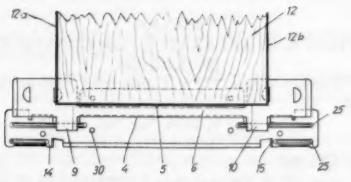
a first profile part having (1) means for framing the edge of a pane, and (2) a flange defining orifices of one diameter; and

a second profile part connected by a hinge to said first profile part, said second profile part having a cover part and a catch member and being pivotal about said hinge in a substantially circular arc between an open position in which each of said orifices are exposed for the passage therethrough of a supporting screw head of a diameter smaller than said one diameter when the profile strip is mounted thereon, and a closed position in which each of said orifices and the directly opposed surface of said cover part in alignment therewith define a space therebetween into which the screw head extends with its rear surface spaced a short distance away from said orifice and said catch member is moved without substantial deformation between the rear surface of the screw head and said orifice for releasably securing the profile strip to the main frame.

4,065,901
CONNECTING ELEMENT FOR WALL OR CEILING PANELS WHEN CONSTRUCTED BY A DRY METHOD

Friedrich Früh, In der Boindte 12, 7441 Neckartenzlingen, Germany

Filed Jan. 13, 1977, Ser. No. 759,177
Claims priority, application Germany, Jan. 16, 1976, 2601498
Int. Cl.[2] E04C *1/28*
U.S. Cl. 52—582 **11 Claims**

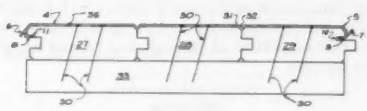


1. A connecting element useful in the assembly of abutting end faces of wall- or ceiling-cladding panels when assembled by the so-called dry construction method wherein the assembly is by abutting the end faces of cladding panels which have the same width and which are assembled by connecting the region of their longitudinal edges through a tongue-and-groove system, wherein the connecting element consists of a sectioned member whose longitudinal median plane, when in use, extends across that of the assembled panels, the sectioned member including two locating strips positioned, at least approximately, in the same plane and which function as supports for the undersides of end face sections of two adjacent panels which are to be assembled end to end, and which strips include stiffening flanges and holes for fixing screws or the like; said sectioned member also including a gap-forming flange having a locating wall between said locating strips for locating the end faces of assembled panels, said gap-forming flange separating said locating strips and having an essentially rectangular cross-section which determines the width of the joint gap, said locating wall projecting approximately at right angles from the plane of the locating strips; wherein at least one longitudinal end of each locating strip is connected with a clamping plate capable of establishing a clamped connection between the sectioned member and one of the panels when assembled, the spacing between said clamping plate and the corresponding locating strip being approximately equal to the distance between the locating strip and a longitudinal groove in the panel, and wherein at least two lateral stops are provided for each locating strip in the direction across the longitudinal axis of the connecting element, the spacing between the stops corresponding either to the distance between two longitudinal side edges of a corresponding panel when assembled therebetween or to the distance between the ground-surfaces of the longitudinal grooves of a panel to be assembled which take part in the connection between a given panel and adjacent panels at either of its longitudinal sides.

4,065,902
SHEETMETAL COVERED ROOF PLANKS HAVING WATERPROOF JOINTS

Sir Walter Lindal, 1120 8th Ave., No. 1702, Seattle, Wash. 98101

Filed Oct. 26, 1976, Ser. No. 735,170
Int. Cl.[2] E04C *2/26, 2/20*
U.S. Cl. 52—622 **8 Claims**



1. A composite sheetmetal covered roofing plank made up as a section of at least two but not more than five, tongue and groove wood planks nailed to the top of at least two cross cleats having a length slightly less than the width of the section an dimensions each equal to the plank thickness with the individual planks having all corners finished in a vee-joint pattern and the sections's edge plank with a groove exposed having the groove slightly widened on its top side to accommodate the thickness of the sheetmetal and the other edge plank with a tongue exposed having a special small groove machined into it, inward the depth of the plank's groove into the plank from the surface of the tongue and on the plane of the tongue to accommodate the thickness of the sheetmetal; said sheetmetal covering is formed so it will clamp into the groove of the section's edge plank, set into the vees between the planks on the section's top surface and snap into the special groove of the plank on the section's other edge; the said sheetmetal is further formed so that two flat folds protrude out of its surface near its edges one being at the section's groove edge at the bottom of the vee and the other being just above the small groove on the section's tongue edge with the flattened folds having a length slightly less than the width of the plank's edge surface between the vee and the groove; said folds being set at an angle close enough to the edge plank's edges to be out of the way during handling and shipping and far enough away to permit the insertion of a pencil-like tool to open out the angle of the folds

at the construction site, along the full length of the section so that when one section is nailed into place a second similar section can be driven by hammering the cleat ends so that the groove of the second section engages the tongue of the first section and its metal fold misses the edge of the first section's metal fold, but each fold strikes the opposing section's edge so that they are driven together and squeezed tightly together between the section edges forming a water-proof joint; said section cleats are placed so that they will occur at planned cross bearers at the construction job so that the sections can be nailed to the cross bearers from the section's underside by nailing the cleats to the cross bearers.

4,065,903

FIXATION AND/OR SUPPORT MEANS

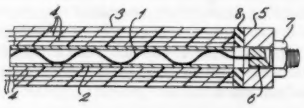
John Godfrey Morley, Little Eaton, England, assignor to National Research Development Corporation, London, England

Filed Nov. 28, 1975, Ser. No. 635,783

Claims priority, application United Kingdom, Dec. 3, 1974, 52249/74

Int. Cl.[2] E04B *1/38*; E04C *3/10*

U.S. Cl. 52—704 **1 Claim**



1. A support means for an artefact which is at least at times to be subjected to longitudinal shear stresses, comprising a support block, a tubular member fixed in a hole within said artefact, and an elongated sinuous or helical core member arranged within said tubular member to engage the inner wall surface of said tubular member and thereby being bonded interfacially to said wall surface, said tubular member extending at least to a point near the edge of said artefact, one end of said core member extending out of said hole and said core member being fixed to said support block, said tubular member contacting said support block so that shear stresses are transferred to said support block through said tubular member and said core member.

4,065,904

SUPPORT SYSTEMS

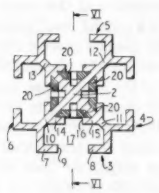
Peter Taylor, 79 Norman Ave., Bradford, and Brian Considine, The Spinney, Hall Drive, Bramhope, Leeds, both of England

Filed Nov. 25, 1975, Ser. No. 635,079

Claims priority, application United Kingdom, Nov. 29, 1974, 51809/74

Int. Cl.[2] E04H *17/16, 17/18*

U.S. Cl. 52—731 **7 Claims**



1. A support system, comprising an elongated post having a core, a face structure comprising a first pair of spaced webs each extending longitudinally of the post and delineating a first longitudinally extending slot, sections joining said webs to said core, second webs extending from said sections and delineating a second longitudinally extending slot aligned with said first slot, said second webs dividing the space between said first webs and said core into a first area between said first and second webs and a second area between said second webs and said core, the second area opening into a groove in, and extending the full length of, said core; and an elongated strip which is a press fit into the second area from one end of the post, said strip being formed with a part through which a series of longitudinally spaced locating holes are formed, and said strip being shaped so that when press fitted within said second area said part is aligned with said slots and said groove remains unoccupied, the strip having surfaces in frictional engagement with the associated webs and joining sections which define said second area.

4,065,905

PREFABRICATED BUILDING SECTIONS OR ROOM UNITS AND METHODS FOR THE MANUFACTURE OF SUCH SECTIONS OR UNITS

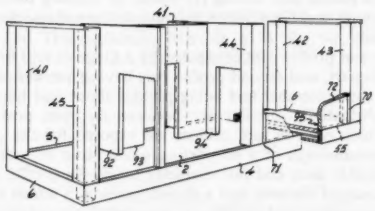
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Continuation of Ser. No. 389,739, Aug. 20, 1973, abandoned. This application Sept. 29, 1975, Ser. No. 617,507

Claims priority, application Switzerland, Aug. 21, 1972, 389739/72

Int. Cl.[2] E04H *1/04*

U.S. Cl. 52—741 **35 Claims**



1. A method for the manufacture of prefabricated building sections at a factory prior to transporting same to the site which comprises making a panel and subsequently connecting at least one vertically disposed metal frame beam having a hollow core to that panel, wherein making the panel comprises the steps of forming a frame of metal beam members, arranging a first plate on said frame, arranging a second plate which is spaced vertically from said first plate on said frame and providing the panel with at least one tubular service conduit, providing an opening completely through said panel which is at least in part extending through and defined by both said frame and said plates, the completed panel thereafter being rigidly connected to said frame beam by welding said beam members to said frame beams whereby the lower part of said frame beam is received through said opening for the entire vertical height of said panel.

4,065,906

METHOD AND APPARATUS FOR CONSTRUCTING BUILDINGS

Stowell Whitney Mears, 777 N. Ocean Blvd., Delray Beach, Fla. 33444

Filed June 9, 1976, Ser. No. 694,408

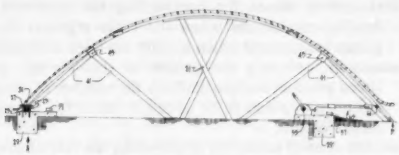
Int. Cl.[2] E04B *1/347*; A45F *1/16*

U.S. Cl. 52—745 **26 Claims**

1. A method of constructing a self-supporting, mountable and demountable prefabricated building structure which includes a flexible integral sheet and a plurality of elongated flexible support members attached thereto the steps comprising:

a. attaching brace members to at least some of said flexible support members at one end of said brace members thereby defining an attached end and an unanchored end of said brace members,

b. positioning the sheet and support members over the area to be covered by the building,
c. securing one of the ends of the support members against lateral movement, thereby to define a secured end and a free end of each of the support members,
d. elevating a portion of the support members to a height less than the peak of the completed building,
e. drawing substantially simultaneously each of the free ends



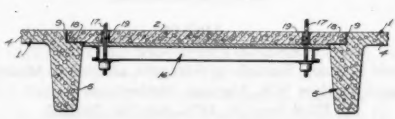
of said members against the secured ends until a building of the desired size is obtained,
f. stabilizing the building structure during construction by forming supports for said structure with the brace members while drawing the free ends of the support members against their secured ends,
g. anchoring the free ends of said support members, and
h. thereafter anchoring the unanchored ends of the brace members to thereby form said building structure.

4,065,907

DEMOUNTABLE MULTIPLE LEVEL BUILDING STRUCTURES

Edward K. Rice, Los Angeles, Calif., assignor to Unicon Parking Structures, Inc., Van Nuys, Calif.

Division of Ser. No. 93,097, Nov. 27, 1970, abandoned. This application Mar. 13, 1973, Ser. No. 340,689
Int. Cl.[2] E04B *1/348*
U.S. Cl. 52—747 **2 Claims**



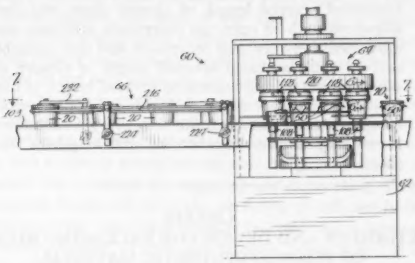
1. A method of constructing a building structure, characterized by:
a. precasting supporting modules, each having transverse guideways;
b. positioning the supporting modules in predetermined spaced and coplanar relation;
c. stacking similarly positioned supporting modules thereon to form a multiple level structure;
d. extending tendons through the guideways and between the supporting modules of an upper level;
e. placing a casting form to extend between spaced supporting modules at said upper level;
f. casting a supported slab in the form and around the portions of tendons extending between the supporting modules;
g. lowering the casting form to a lower position at the level of a lower pair of spaced supporting modules while having said cast slab supported at said upper level;
h. extending tendons through the guideways and between the supporting modules at the lower level;
i. casting a further supported slab, in said casting form and repeating said step of lowering said casting form and repeating said step of lowering said casting form;
j. and after completion of each level tensioning, the tendons exert transverse compression loads in the supporting and supported modules.

4,065,908

METHOD AND APPARATUS FOR SEALING TAMPER-INDICATING TABS TO A CONTAINER SIDEWALL

Martin Mueller, Wonderlake, Ill., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 26, 1976, Ser. No. 680,467
Int. Cl.[2] B65B *7/28, 51/14, 51/18, 51/32*
U.S. Cl. 53—15 **27 Claims**



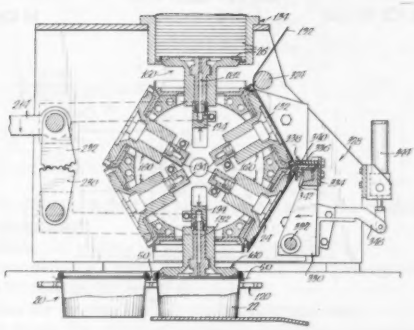
1. The method of completing a double-seal tamper-indicating container having an inner sheet closure and an outer lid closure means, said method comprising: disposing a heat-securable tamper-indicating sheet over the top edge of a container sidewall, positioning said sheet so that tabs thereon project from the periphery of said container sidewall, applying an outer lid closure means over the top edge of the container sidewall and the marginal portion of said sheet, moving said container upright along a process path, deflecting said projecting tabs downwardly during movement of said container along said path to position the tabs alongside said sidewall while subjecting said tabs to a first application of heat whereby said tabs take on a heat-set orientation in a downwardly deflected position, moving said container between a pair of opposed first and second tab sealing members located adjacent said path, subjecting said tabs to a second application of heat with at least one of said sealing members, and pressing each of said heated tabs against said sidewall with both of said sealing members to secure said tabs against said sidewall.

4,065,909

METHOD AND APPARATUS FOR APPLYING A LID AND TAMPER-INDICATING SHEET TO A CONTAINER

Martin Mueller, Wonderlake, Ill., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 26, 1976, Ser. No. 680,466
Int. Cl.[2] B65B *7/28*
U.S. Cl. 53—15 **36 Claims**



1. The method of applying a closure to a receptacle comprising:

moving an open top receptacle along a processing path;

providing a supply of flexible closure sheet and a quantity of stacked lids adjacent the said path; temporarily attaching a lid to a transfer member adjacent to said processing path;

subsequently superposing a length of closure sheet in surface contact on said lid to form a two-ply assembly and attaching portions of said sheet extending beyond said lid to said transfer member;

severing said length of sheet from said supply; moving said transfer member to position said assembly of said lid and associated severed length of closure sheet into vertical alignment with an open top receptacle; effecting relative movement between said receptacle and said assembly of said lid and associated severed length of closure sheet, whereby said lid and associated severed length of closure sheet are simultaneously seated within the open top of said receptacle; and releasing the temporary attachment between said transfer member, lid and length of closure sheet.

4,065,910

METHOD OF AND DEVICE FOR PACKAGING BLOCKS OF FOAMED SYNTHETIC MATERIAL

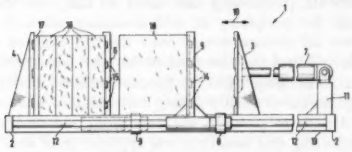
Günter Eiselt, Unkel, Germany, assignor to Recticel Deutschland Kunststoffe GmbH, Rheinbreitbach, Germany

Filed Aug. 24, 1976, Ser. No. 717,167

Claims priority, application Germany, Sept. 4, 1975, 2539289

Int. Cl.² B65B *63/02*

U.S. Cl. 53—24 **10 Claims**



1. The method of packaging block like articles of foamed elastic material to reduce transporting costs thereof which comprises in combination the steps of: arranging the articles in face to face engagement and in alignment, compressing the articles individually in the direction of alignment thereof to assure stable characteristics thereof, stacking the individually compressed articles in compressed condition, and finally enclosing the individually compressed articles in a package.

4,065,911

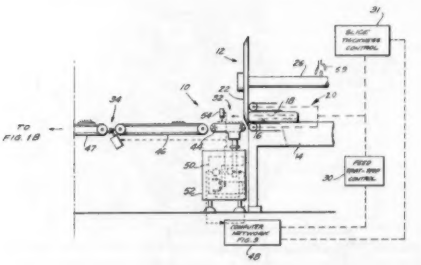
BACONWEIGHER

John C. Fagan, Oak Lawn, Ill., assignor to Amtron, Division of the Sippican Corporation, Midlothian, Ill.

Filed July 12, 1976, Ser. No. 704,331

Int. Cl.² B26D *4/56*

U.S. Cl. 53—53 **10 Claims**



1. A combination slicing and weighing machine comprising: a slicing machine having a slicing blade and a feed mechanism for feeding products to be sliced with the slicing blade;

receiving and conveying means for receiving the sliced product coming from the slicing machine;

scale means coupled with the receiving and conveying means for weighing the weight of the sliced product, the scale means being so constructed and arranged to weigh the sliced product at an initial lighter group weight below a heavier draft target weight;

first control means for interrupting the operation of the feeding mechanism when the scale registers the initial group weight and when a draft has been completed;

means for counting the number of slices in the group of sliced product and particularly the number of slices in the lighter group and to be added to reach the heavier draft target weight;

second control means for determining the rate of advance of said feeding mechanism towards such slicing blade and, consequently, the sliced thickness, said second control means feeding the product at a first feed rate and a second feed rate;

calculating means for subtracting the weight of the initial lighter group from the heavier target weight, and multiplying the weight difference by the ratio of the slices in the initial lighter group to the weight of this group to determine the number of slices to be added to produce the heavier draft target weight without changing the slice thickness;

means for calculating the number of slices required to be added for the heavier draft target weight rounded off to the nearest whole integer; and

means for correcting the weight error produced by rounding off to the nearest whole integer by multiplying the first feed rate by the ratio of the number of slices calculated to produce the target weight by the number of slices rounded off to the nearest integer to provide a new second feed rate which will produce a whole number of slices at the thickness to produce the draft target weight.

4,065,912

CANE CUTTING APPARATUS

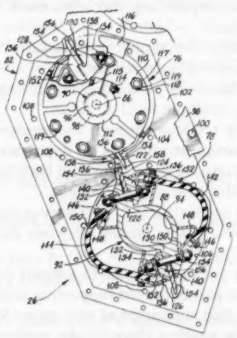
Donald J. Quick, Bundaberg, Australia, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands

Filed June 28, 1976, Ser. No. 700,691

Claims priority, application United Kingdom, July 12, 1975, 29356/75

Int. Cl.² A01D *45/10*; B26D *7/06*

U.S. Cl. 56—13.9 **4 Claims**



1. A sugar cane harvester with base cutting means operable to sever cane sticks from their roots; cane stick feeding means operable to feed severed cane sticks into the harvester; cane cutting apparatus mounted in the harvester to receive whole cane sticks from the cane stick feeding means and operable to cut each cane stick into at least two pieces; conveyor means to

convey cut cane sticks away from the cane cutting apparatus; and drive means to drive the base cutting means, the cane stick feeding means, the cane cutting apparatus and the conveyor means; wherein the cane cutting apparatus includes a pair of cutting elements each of which is rotatably journaled on the harvester for rotation about parallel axes, at least one blade on each cutting element positioned to overlap and cooperate with a blade on the other cutting element to cut sticks passing between the cutting elements as the cutting elements rotate, each of said blades is formed from a rectangular flat steel plate with a first side surface, a second side surface, substantially parallel to the first side surface, a cutting edge running the length of the flat steel plate and spaced to one side of a plane substantially parallel to and half way between the first and second side surfaces, a first beveled surface extending the length of the flat steel plate and from the first side surface through said plane half way between the first and second side surfaces and to the cutting edge, a second beveled surface extending the length of the flat steel plate and from the second side surface to the cutting edge and having a width from the second side surface to the cutting edge that is not greater than one fourth the width of the first beveled surface extending from the first side surface to the cutting edge, clamping means for clamping each blade to a cutting element so that the cutting edge of a blade on one cutting element is parallel to the axis of rotation of the cutting element on which it is clamped and is positioned from the axis of rotation of the cutting element on which it is clamped a distance greater than one half the distance from the axis of rotation of one cutting element to the axis of rotation of the other cutting element and so that said second side of a blade on one cutter element moves into a position adjacent the said second side of a blade on the other cutter element during each rotation of the cutter elements, and a cane cutting apparatus timing and drive means for counter rotating the cutting elements and holding the blades so that when the second side of a blade on one cutting element is adjacent and parallel to the second side of a blade on the other cutter element, the distance between said second sides of the two adjacent blades is at least four millimeters.

4,065,913

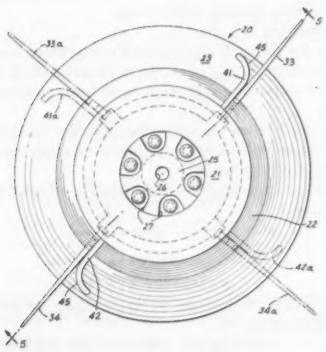
SAFE CUTTER DISC ASSEMBLY FOR ROTARY LAWN MOWER

Gerald C. Fisher, Shelby, Ohio, and Joseph E. Scanland, Savannah, Ga., assignors to Roper Corporation, Kankakee, Ill.

Continuation-in-part of Ser. No. 611,347, Sept. 8, 1975, abandoned. This application Feb. 7, 1977, Ser. No. 766,377

Int. Cl.[2] A01D *55/18*

U.S. Cl. 56—295 **39 Claims**



1. A safe cutter disc assembly for a rotary lawn mower of the type having a shallow inverted enclosure comprising, in combination, a disc having a circular central portion and an annular outer portion, the annular outer portion being downwardly offset and connected to the central portion by means of a shallow vertically extending wall, at least the annular portion being formed of resiliently deformable plastic, a plurality of spaced radially extending openings being provided in the wall, cutter pins registered in the respective openings, said cutter pins being formed of durable plastic, each pin having a head with a relatively stiff shank, the shank adjacent the head being dimensioned to fit in the associated opening and each pin having a long tapering flexible tip portion, the wall of the disc having substantial radial thickness for rigid support of the pins cantilever fashion, the wall of the disc having a relatively shallow vertical dimension so that the annular outer portion of the disc closely underlies and protects the relatively stiff shank portions of the pins while the tip portions of the pins project beyond the periphery of the disc into cutting engagement with the grass and are free to bend back into the protection of the annular outer portion of the disc upon striking of an obstruction, and backstop means on the annular portion of the disc adjacent the openings for engaging and supporting the pins during this backward bend, the pin being of sufficiently thick dimension over the shank portion that the pin is supported beam-like adjacent its head end, in radial position by the wall of the disc as the disc revolves during mowing free from reliance upon centrifugal force to hold the pin outwardly in cutting engagement with the grass and thus capable of performing a typical mowing operation at conventional rotative speeds on the order of 3000 rpm.

4,065,914

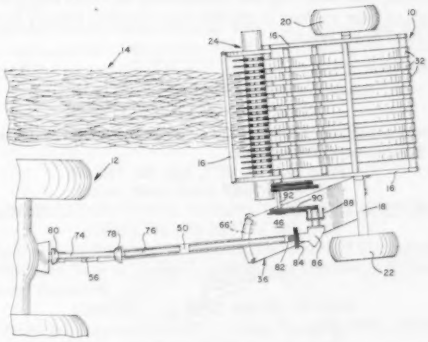
OFFSET BALER WITH STEERABLE CONTROL

Carmen S. Phillips; Ralph E. Beyer, and Gerald E. Sepich, all of Memphis, Tenn., assignors to International Harvester Company, Chicago, Ill.

Filed Mar. 15, 1976, Ser. No. 666,805

Int. Cl.[2] A01D *39/00*

U.S. Cl. 56—341 **8 Claims**



1. In a baler adapted for towing by a tractor, the combination comprising:

a pickup for picking up hay from a windrow;

means defining a transversely extending bale forming zone for receiving hay from the pickup;

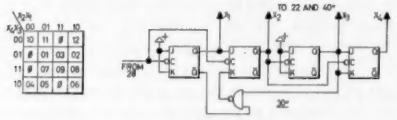
means for forming the hay into a cylindrical bale;

and means for selectively steering said baler transversely relative to said tractor during bale formation to control the feed of hay along the transverse extent of said zone to form bales of uniform diameter.

4,065,915
BINARY COUNTING SYSTEM

John S. Farnbach, 756 Jefferson Ave., Loveland, Colo. 80537

Continuation of Ser. No. 368,643, June 11, 1973, abandoned. This application July 2, 1975, Ser. No. 592,455
Int. Cl.[2] G04C *3/00*
U.S. Cl. 58—23 R 16 Claims

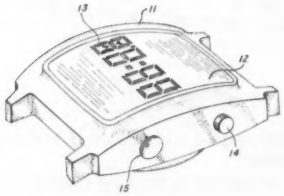


1. An electrically operating clock comprising:
a. constant frequency signal source;
b. means for converting the output cycles from said signal source to a signal of desired frequency;
c. means for displaying units of time in ordinary decimal notation;
d. display actuating means for driving said displaying means comprising counting means for converting said signal of desired frequency to binary signals representing at least the hours digits of the units of time, the number of said binary signals being such that one less binary signal would provide an unsufficient number of possible distinct binary logic states to represent all of said represented hours counts; and
wherein said counting means includes means for organizing the logic states of said binary signals so that, with respect to each particular units digit, there is at least one common binary signal which assumes the same binary value in the representation of all of said hours counts possessing said particular units digit, and the common group containing all of said common binary signals is exclusive to said particular units digit in that, in the representation of every one of said hours counts not possessing said particular units digit, at least one of said binary signals belonging to said common group assumes the binary value which is distinct from said binary value which results in the representation of hours counts possessing said particular units digit; and
wherein said binary signals representing the hours digits of the units of time are four in number and represent exactly twelve distinct hours counts.

4,065,916
ELECTRONIC TIMEPIECE

Horst Leuschner, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 17, 1977, Ser. No. 759,696
Int. Cl.[2] G04C *3/00;* G04B *19/00*
U.S. Cl. 58—23 BA 24 Claims

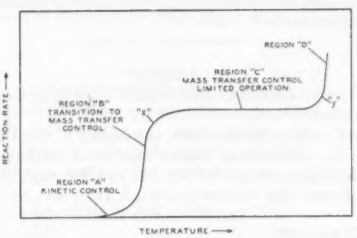


1. An electronic timepiece comprising:
a. electronic timekeeping circuitry responsive to a reference frequency signal for generating electrical signals indicative of timekeeping functions;
b. display means coupled to said timekeeping circuitry and responsive to said electrical signals for displaying said timekeeping functions;
c. switch means coupled to said electronic timekeeping circuitry for controlling a function thereof;
d. battery receiving means for receiving battery means to power said electronic timekeeping circuitry; and
e. shutdown latch circuit means coupled to said battery receiving means and to said switch means, said latch circuit means being responsive to a voltage applied from said battery receiving means for toggling to a first state in which power consumption by preselected circuits of said electronic timekeeping circuitry is inhibited and responsive to said switch means for toggling to a second state in which power consumption by said preselected circuits is enabled upon the first activation of said switch means after said latch circuit means is set in said first state, said latch circuit means remaining in said second state so long as a voltage is present from said battery receiving means, wherein
f. battery power during the "shelf-life" of the electronic timepiece is conservable with said latch circuit in said first state.

4,065,917
METHOD OF STARTING A COMBUSTION SYSTEM UTILIZING A CATALYST

William C. Pfefferle, Middletown, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Division of Ser. No. 644,873, Dec. 29, 1975, which is a continuation-in-part of Ser. No. 142,939, May 13, 1971, abandoned, Ser. No. 164,718, July 21, 1971, abandoned, and Ser. No. 358,411, May 8, 1973, Pat. No. 3,928,961. This application Dec. 20, 1976, Ser. No. 752,272
Int. Cl.[2] F02C *3/04*
U.S. Cl. 60—39.82 C 2 Claims



1. A turbine system, comprising:
a gas turbine;
means for forming a mixture of compressed air and fuel;
a combustor having a catalyst disposed therein for receiving and combusting said mixture to form a combustion effluent;
means for preheating said catalyst in the substantial absence of unburned fuel prior to the introduction of said mixture into said combustor; and
means for supplying said combustion effluent to drive said turbine.

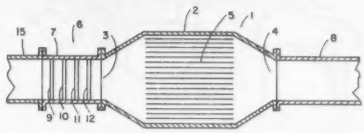
4,065,918
EXHAUST SYSTEMS

Ellis B. Rifkin, Southfield, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Feb. 12, 1973, Ser. No. 331,680
Int. Cl.[2] F01N *3/15*
U.S. Cl. 60—274 16 Claims

1. A catalytic reactor resistant to plugging when used in the exhaust system of an internal combustion engine operating on gasoline containing a cyclopentadienyl manganese antiknock compound, said catalytic reactor comprising a reactor housing

having an inlet and an outlet and containing a catalyst bed between said inlet and said outlet such that said exhaust gas passes through said catalyst bed in passing from said inlet to said outlet, said inlet having a cross-sectional area substantially less than the area of the entry face of said catalyst, said housing having an expansion zone between said inlet and said entry face, said reactor including a conduit section connected to said inlet extending away from said expansion zone, said conduit



section containing a plurality of transverse baffles, each of said baffles having at least one large opening through which exhaust gas can pass, said openings being arranged such that the openings in one baffle are not substantially in axial alignment with the openings in an adjacent baffle, the space between each baffle being empty, said baffles forming an unimpeded tortuous flow path through said conduit section, said baffles functioning to inhibit the plugging of said catalyst bed by manganese compounds in said exhaust gas.

4,065,919

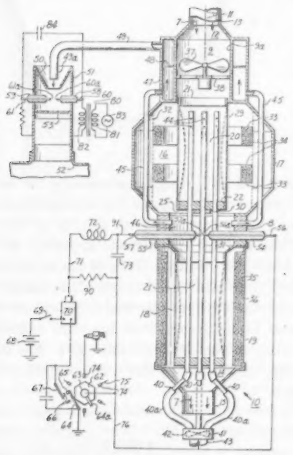
POLLUTION MINIMIZING DEVICE AND METHOD FOR INTERNAL COMBUSTION ENGINES

Hrant Eknayan, 7528 Columbia, Rosemead, Calif. 91770

Continuation-in-part of Ser. No. 382,373, July 25, 1973, Pat. No. 3,882,677. This application Jan. 17, 1975, Ser. No. 541,894

Int. Cl.[2] F01N *3/15;* **F02M** *25/06*

U.S. Cl. 60—274 **7 Claims**



3. Method of reducing the quantity of pollutant mixed with the gaseous products of combustion of hydrocarbon fuel in an internal combustion engine which comprises:

mixing the combustion products with atmospheric air, straining the mixture through an expandable basket comprising lengths of small cross-section copper wires placed closely together, offering variable porosity with respect to the passage of gas between the wires, and subjecting the strained mixture to intermittent sparks.

4,065,920

TWO BARREL CARBURETOR

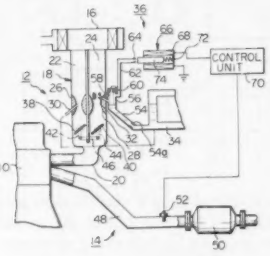
Hidehiro Minami, No. 1403, Matano-cho, Totsuka, Yokohama, and Makio Waku, No. 1-22-6, Motomachi, Urawa, both of Japan

Filed Mar. 2, 1976, Ser. No. 663,140

Claims priority, application Japan, Mar. 7, 1975, 50-31752[U]

Int. Cl.[2] F02B *75/10*

U.S. Cl. 60—276 **6 Claims**



1. A combination for an internal combustion engine having intake and exhaust conduit systems, comprising:

a carburetor disposed in said intake conduit system and having a float chamber and first and second barrels which are united at their downstream portions:

first and second throttle valves rotatably disposed in said first and second barrels respectively at positions upstream of the united portion of said first and second barrels, means for rotating said first and second throttle valves synchronously;

first and second fuel nozzles projecting into said first and second barrels of said carburetor at positions upstream of said first and second throttle valves;

first and second fuel lines independently providing communication for said first and second fuel nozzles with said float chamber, said float chamber being common to both fuel nozzles;

an exhaust gas sensor disposed in said exhaust conduit system for developing a signal representing and corresponding to the condition of gases exhausted from said engine; and

control means communicating with said exhaust gas sensor and only said second fuel line for controlling the amount of fuel passed through said second fuel line in response to said signal applied from said exhaust gas sensor.

4,065,921

HYDRAULIC CONTROL MEANS, PARTICULARLY FOR VEHICLE STEERING MEANS

Johannes Vagn Baatrup, Sonderborg, and Thorkild Christensen, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Nov. 24, 1976, Ser. No. 744,624

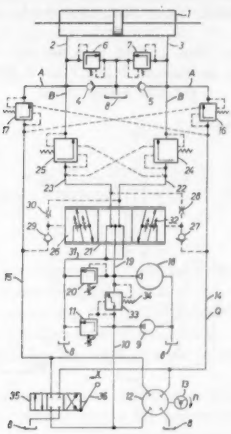
Claims priority, application Germany, Nov. 29, 1975, 2553748

Int. Cl.[2] F15B *15/18*

U.S. Cl. 60—385 **8 Claims**

1. A hydraulic control unit for a servomotor comprising a control circuit having a pump and a hand operated metering motor, and operating circuit having a pump, said control and operating circuits intersecting upstream of said servomotor, a pressure comparison throttling and proportioning valve having first and second ports, connected respectively to said control and operating pumps and a third port connected to said metering motor, said proportioning valve being controlled by a differential pressure applied to said first and second ports and

having a normal operating mode in which there is a major fractional flow of fluid from said first port to said third port



and a minor fractional flow of fluid from said first port to said second port.

4,065,922

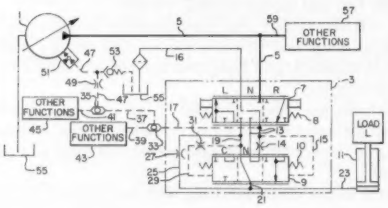
LOAD LIFTING AND LOWERING CONTROL SYSTEM

James I. Ott, Portland, and Delmar G. Schwab, Milwaukie, both of Oreg., assignors to Hyster Company, Portland, Oreg.

Filed Aug. 23, 1976, Ser. No. 716,476

Int. Cl.[2] F16H *39/46*

U.S. Cl. 60—445 **21 Claims**



1. A hydraulic control system for controlling the lifting and lowering of a load comprising:

a source of hydraulic pressure fluid;

a hydraulic lifting and lowering motor;

a main control valve having a first, selectively positionable, control spool, the valve operatively connected to the fluid source and to the motor;

and a variable pressure compensated lowering speed control, the control including a second control spool sensitive to system flow associated with the main control valve, the second spool operable to vary fluid flow within the system in response to selective positioning of the first spool.

4,065,923

BARRIER CONSTRUCTION FOR WATER CARRIED POLLUTANTS

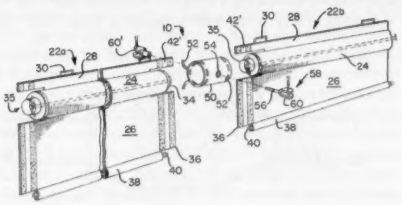
Paul Preus, 21 Smith Road, Toms River, N.J. 08753

Continuation-in-part of Ser. No. 676,794, April 14, 1976. This application Oct. 5, 1976, Ser. No. 729,713

Int. Cl.[2] E02B *15/04*

U.S. Cl. 61—1 F **4 Claims**

1. A barrier for water carried pollutants comprising a series of end to end connected boom sections, each of said boom sections comprising a hollow tubular sleeve containing a floatable material therein, said barrier characterized by a cable extending through each said sleeve and having an eye at each end externally of the ends of the sleeve, a separable connector passing transversely through and connecting the eyes of adjacent boom sections, said barrier further characterized by end covers for each end of the tubular sleeve of each section, each of the end covers including means securing the covers to the



ends of the tubular sleeve and each said end covers including a longitudinally extending sleeve portion having a diameter large enough to freely pass the eyes of the cable extending through the hollow tubular flotable material receiving sleeve, and draw strings carried at each end of each sleeve portion whereby the end covers may be secured about the cable extending through the boom sections.

4,065,924

METHOD OF LINING A WATERWAY OR RESERVOIR

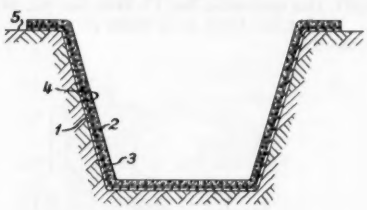
Daniel Arthur Young, Blackgrove Farm, Tandridge Lane, Lingfield, Surrey, England

Filed June 17, 1975, Ser. No. 587,626

Claims priority, application United Kingdom, June 20, 1974, 27387/74

Int. Cl.[2] E02B *5/02*

U.S. Cl. 61—7 **7 Claims**



1. A method of lining a waterway or reservoir, which method comprises the steps of laminating a layer of flexible and liquid impervious material with a layer of fibrous material to form a flexible base lamination, applying the lamination to cover at least part of the surface of the waterway or reservoir with the flexible and liquid impervious material adjacent the surface and the fibrous material situated on the side of the flexible and liquid impervious material opposite the surface, and applying to the fibrous material a thin exterior layer of high density concrete to form a key with the fibrous material underneath.

4,065,925

UNDERGROUND DRAINAGE PIPE

Robert Sinbad Auriemma, R.D. No. 1, Bethel, Pa. 19507

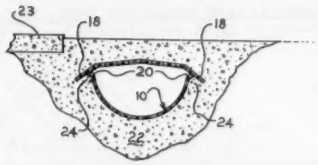
Continuation-in-part of Ser. No. 529,236, Dec. 3, 1974. This application May 3, 1976, Ser. No. 682,492

Int. Cl.[2] F16L *21/00;* **E02B** *11/00*

U.S. Cl. 61—11 **10 Claims**

1. An underground drainage pipe formed of an extruded stiffly flexible plastic material having a rounded water carrying trough with normally diverging column lips at the edges of the trough; a roof overlying the trough and including a central

high point forming a ridge extending along the pipe and wings on the edges of the roof integrally joining, overlying and extending downwardly beyond the column lips of the trough; the circumferential length of the roof being shorter than a circumferential length of the trough, the upper surfaces of the wings being essentially planar, the column lips extending away



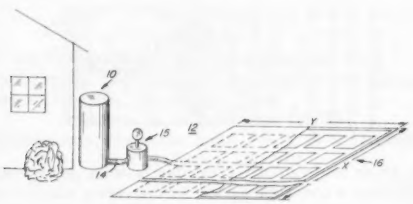
from the wings at angles essentially 90° to the upper surfaces of the wings so that upon stress loading of the pipe the height of the pipe is reduced, the trough and roof buckle and the wing surfaces are rotated normal to the loading force to rotate the column lips parallel to the force and into column loading positions.

4,065,926

SUBTERRANEAN IRRIGATION SYSTEM

Edison R. Brandt, 951 DeSoto Road, Apt. 525, Boca Raton, Fla. 33432

Filed July 18, 1975, Ser. No. 597,194
Int. Cl.² E02B *13/00*; N01G *25/06*
U.S. Cl. 61—13 **6 Claims**



1. An irrigation system for selectively conveying and applying a liquid from a source of such liquid to an area of ground to which such liquid is to be applied while avoiding interference with the above-ground use of such area, said irrigation system comprising:

a plurality of flow passages connected relative to one another so far as to form an array of said flow passages having an entrance thereto, the array having an area substantially equal to such area of ground, said plurality of flow passages being formed from two sandwiched sheets of plastic periodically sealed together at various common non-overlapping areas to form a resultant grid pattern of non-sealed interconnected passages which form said array of said interconnected flow passages, said plurality of flow passages having means defining apertures therein of a size and quantity as to effect the substantially even distribution of such liquid to such ground area, said plurality of flow passages being entirely interred within such ground area; and

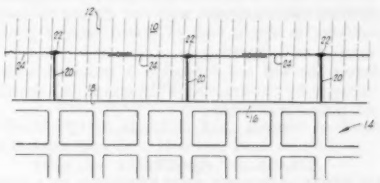
means for connecting such array of said plurality of flow passages to such source of such liquid.

4,065,927

METHOD FOR BLOCKING GAS FLOW IN A COAL SEAM

J. Gilbert Davis, II, Morgantown, W. Va., assignor to Continental Oil Company, Ponca City, Okla.

Filed Jan. 20, 1975, Ser. No. 542,149
Int. Cl.² E02D *3/14*; E21F *15/00*
U.S. Cl. 61—36 R **14 Claims**



1. In the mining of coal from a seam in which methane gas flow to a mining or rib face is blocked by positioning of a barrier fluid in the seam in the path of gas flow, the improvement comprising:

drilling a plurality of substantially parallel holes into the seam from said face in a direction substantially parallel to the direction of the flow of gas from the interior of said seam;

forming a notch in the coal seam at the interior end of each of the holes;

introducing a hydraulic fracturing fluid under pressure into said notches via said holes;

hydraulically fracturing the coal seam along one or more planes of fracture propagated from each of said notches and extending substantially normal to the direction of gas flow through the coal seam to said face; and

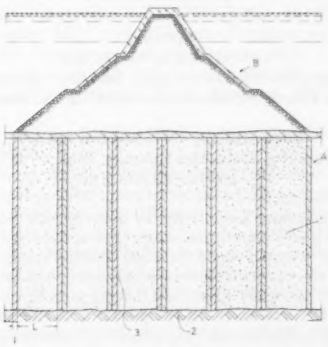
stationarily positioning a barrier fluid in said fracture to effectively block the gas flow to said face.

4,065,928

METHOD FOR CONSTRUCTING A RELIABLE FOUNDATION IN SOFT SOIL FORMATIONS

Atsushi Takagi, Yokohamashi; Hiroyuki Kuroiwa, Chofushi; Masao Miyaguchi, Tokyo, and Tateo Kawamura, Tokyo, all of Japan, assignors to Takenaka Komuten Company, Ltd., Osaka, Japan

Filed Sept. 2, 1976, Ser. No. 719,698
Claims priority, application Japan, Sept. 11, 1975, 50-110570
Int. Cl.² E02D *3/12*
U.S. Cl. 61—36 R **6 Claims**



1. A method of constructing a tubular pile foundation in soft soil formations comprising

agitating the soft soil to form an agitated region like a tube with single annular section to the depth reaching a bed-

rock or to the substantial depth enough to provide required bearing capacity with the soft soil formations,

injecting chemical hardener slurry into the soft soil during said agitating,

simultaneously mixing the chemical hardener slurry with the soft soil to give soil mixture to be solidified,

repeating foregoing steps before the last agitated tubular region is completely solidified so that a new agitated tubular region is adjacent to or partly overlapped said last agitated tubular region, and

solidifying in situ a wall of linked tubular piles formed through said repeating,

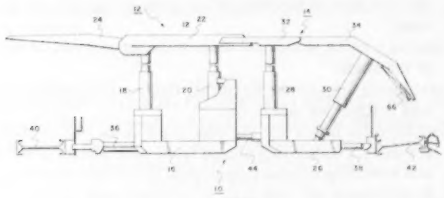
wherein the soft soil formation is provided with bearing capacity by constructing a structural wall foundation of the linked piles therein.

4,065,929

MINE ROOF SUPPORT AND METHOD IN LONGWALL MINING OF THICK MINERAL SEAMS

Terry Lee Simpson, Westminster, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 8, 1976, Ser. No. 664,437
Int. Cl.[2] E21D *15/44*
U.S. Cl. 61—45 D **8 Claims**



1. In a longwall mining system, a roof support adapted to extend transversely between a face and a gob side conveyor comprising:

a. a forward and an aft chock-type roof supporting unit disposed in line, one behind the other, said forward and aft roof units each being supported by at least two pairs of side-by-side props, the rear end of the forward roof supporting unit being interconnected with the front end of the aft roof supporting unit so as to permit relative movement of said forward and aft roof supporting units in the direction of advance;

b. means for separately anchoring and depressurizing each of said units; and

c. means for independently advancing either of said units in a depressurized state toward the longwall face.

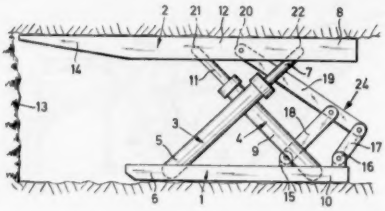
4,065,930

MINE ROOF SUPPORT

Klaus Spies, Dortmund-Persebeck, Germany, assignor to Bochumer Eisenhutte Heintzmann GmbH & Co., Bochum, Germany

Filed Mar. 31, 1977, Ser. No. 783,469
Claims priority, application Germany, May 19, 1976, 2622208
Int. Cl.[2] E21D *15/44*
U.S. Cl. 61—45 D **11 Claims**

1. A mine roof support for an underground mine gallery comprising sole plate means adapted to rest on the floor of a mine gallery and having a front end directed toward the mine face and an opposite end; roof sheild means upwardly spaced from said sole plate means and having a front end directed towards the mine face and an opposite rear end; at least one extensible and collapsible prop pivotally connected at opposite ends to said roof shield means and said sole plate means and extending from the latter forwardly and upwardly inclined toward said roof shield means; at least one additional extensible and collapsible prop pivotally connected at opposite ends to said roof shield means and said sole plate means and extending from the latter upwardly and rearwardly inclined towards said roof shield means; and means for maintaining the position of said props relative to said sole plate means and said roof shield means and comprising a laminescate guide arrangement including two shorter links and one longer link connecting said



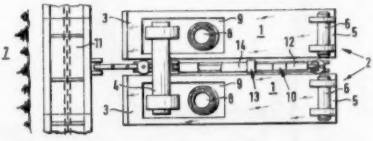
shorter links and projecting with an end portion beyond the latter, said shorter links being pivotally attached at the ends thereof spaced from said longer link to one of said two first-mentioned means and said end portion of said longer link being pivotally attached to the other of said two first-mentioned means.

4,065,931

GUIDING ARRANGEMENT FOR UNDERGROUND EXCAVATING SYSTEMS

Gustav Neu, Bochum, and Hans-Ferdinand Bemmerl, Herne, both of Germany, assignors to Bochumer Eisenhutte Heintzmann GmbH & Co., Bochum, Germany

Filed May 9, 1977, Ser. No. 794,933
Claims priority, application Germany, May 21, 1976, 2622886
Int. Cl.[2] E21D *15/44*
U.S. Cl. 61—45 D **22 Claims**



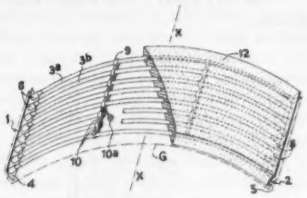
1. In an underground excavating system, a combination comprising a conveyor device for conveying material away from a mine face; an excavation roof support device for supporting the roof of the excavation; advancing means operatively connected to both of said devices for advancing one of said devices towards the mine face while the other of said devices remains stationary, and vice versa; and means for guiding said one device during its advance towards the mine face, including a pair of spaced apart elongated support members having one end region located closer to the mine face and another opposite end region located further from the mine face, a pair of guide sleeve members one at each of said end regions, each sleeve member having wall portions bounding a passage through which end portions of said support members pass at a spacing relative to each other, a pair of insert members one being connectable with said conveyor device and another being connectable with said advancing means, each insert member being located in a respective passage of said sleeve members and being received between said end portions of said support members for maintaining said end portions at said spacing, and means for detachably connecting said insert members and said support members to said sleeve members, whereby rapid interchange of any of said members which are defective with a replacement member is obtained.

4,065,932

CASING VOUSSOIR AND METHOD FOR PRODUCING THE VOUSSOIR

Jacques Francois Oger, Pont a Mousson, France, assignor to Sogelerg, Chevilly-Larue and Setec Travaux Publics, Paris Cedex, both of, France

Continuation of Ser. No. 577,790, May 14, 1975, abandoned.
This application Dec. 10, 1976, Ser. No. 749,259
Claims priority, application France, May 27, 1974, 74.18257
Int. Cl.[2] E21D *5/11;* E01G *5/02*
U.S. Cl. 61—45 R 6 Claims



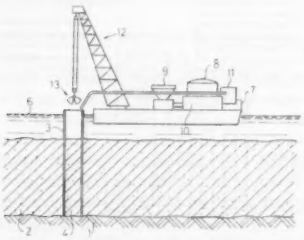
1. A casing voussoir comprising a metal frame and a mass of concrete anchored to the frame, said frame and mass of concrete having the shape of a sector of a cylindrical ring with radial end faces, said frame comprising two end plates disposed along said radial faces and circumferential bars embedded in the concrete and interconnecting said plates, said bars being separate from the plates and fixed on the plates by a fixing filler material distinct from the concrete, said plates having inner surfaces which receive the ends of the bars with interpostion of said filler material to insure a precise circumferential size of the voussoir, said plates and the ends of the bars forming a gap occupied by the filler material, said plates having inwardly protruding cup-shaped members, said bars having ends of a diameter substantially smaller than the internal diameter of the cup-shaped member to permit movement between the ends of the bars and the cup-shaped members prior to placement of the filler material and the concrete to obtain the precise circumferential size of the voussoir.

4,065,933

METHOD OF REFORMING THE GROUND

Ichiro Katayama, Nishinomiyashi, Japan, assignor to Takenaka Komuten Company, Ltd., Osaka, Japan

Filed Sept. 30, 1976, Ser. No. 728,138
Claims priority, application Japan, Feb. 2, 1976, 51-10108
Int. Cl.[2] E02D *3/12, 27/02*
U.S. Cl. 61—50 2 Claims



1. A method of reforming soft ground or stratum under water with a chemical hardener, said method comprising the steps of:

driving at least one casing into the soft soil layer under the water to enclose and isolate a definite volume of the soft soil from the surrounding soft soil layer;

removing the definite volume of the soft soil from the casing using a removing device mounted on a working barge above the casing, and placing the removed soil in a hopper on the barge;

feeding the soft soil from the hopper and the chemical hardener from a feeder mounted on the barge into a mixer mounted on the barge;

kneading the soft soil together with the chemical hardener in the mixer;

returning the treated soil into the casing with a pump mounted on the barge; and

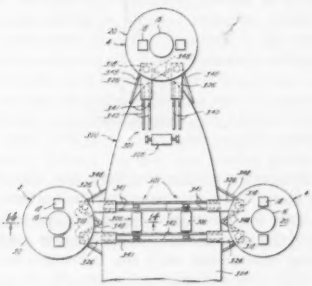
removing the casing, leaving a submerged pile of hardened soil.

4,065,934

RIG TRANSPORT METHOD

Edward David Dysarz, Houston, Tex., assignor to James G. Brown & Associates, Inc., Houston, Tex.

Filed Dec. 10, 1975, Ser. No. 639,431
Int. Cl.[2] E02B *17/04*
U.S. Cl. 61—87 6 Claims



1. Method of transporting a structure for erection offshore having a truss work portion and three elongated members extending therefrom each connected thereto at only one end, comprising

placing said structure in a position on one end of a ship with two of said members extending vertically down on opposite sides of the ship and the third member extending vertically down at the end of the ship, and

causing said ship to move to location while maintaining said structure in said position.

4,065,935

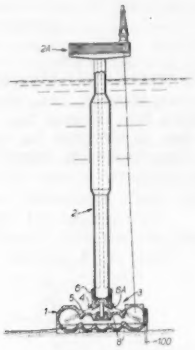
ARTICULATED JOINTS FOR DEEP WATER INSTALLATIONS

Reginald Edward Dowton Burrow, Hatch End, and David Edmund Plaskitt, High Wycombe, both of England, assignors to Taylor Woodrow Construction Limited, England

Filed July 16, 1976, Ser. No. 705,933
Claims priority, application United Kingdom, July 18, 1975, 30310/75
Int. Cl.[2] E02D *21/00*
U.S. Cl. 61—95 13 Claims

1. An articulated joint for a deep water installation in which two structural members are connected so as to afford limited pivotal movement between the members, the joint comprising replaceable flexible tendons connecting the structural members with a clearance between the members, each said tendon terminating at each end in a cylindrical member that is entered, at a mounting station associated with the relevant structural member, in a tubular portion of a tendon anchorage, there being access from the interior of each of the structural members to that end of each of said tendons that is connected to this structural member; each said tendon being releasably engaged at one end in its anchorage in one structural member, disposed in fluid-tight manner with respect to this structural member, the mounting station for each tendon is this structural member

being adapted to have fitted at it a pressure bottle for containing the tendon whilst maintaining the fluid-tight sealing relationship of the tendon with the structural member, and each said tendon being held releasably fast with respect to said other structural member by a screw-threaded member mounted on said cylindrical member at the other end of the tendon; removal of the tendon from the joint being effected, with the pressure bottle fitted and the tendon released at its other end from the other structural member by removing said screw



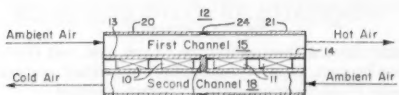
threaded member, by pressurizing the bottle, releasing said one end of the tendon, and depressurizing the bottle to permit the tendon to enter the bottle; there being a tendon extension at the other end of the tendon which is arranged to enter into fluid-tight sealing relationship with the last-mentioned structural member, when entry of the tendon into the pressure bottle is completed, thereby permitting removal of the tendon and the bottle from the tendon extension and fitting of a replacement tendon to the tendon extension.

4,065,936

COUNTER-FLOW THERMOELECTRIC HEAT PUMP WITH DISCRETE SECTIONS

John William Fenton, Wilmette; Jerry Stevenson Lee, Buffalo Grove, and Richard James Buist, Palatine, all of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed June 16, 1976, Ser. No. 696,605
Int. Cl.[2] F25B *21/02*
U.S. Cl. 62—3 **8 Claims**



1. A counter-flow thermoelectric heat pump comprising:

a first thermoelectric module and a second thermoelectric module, both disposed in substantially the same plane, and electrically intercoupled so as to transfer heat from one side of the modules to the other side when the modules are energized;

means, including cover plates, disposed around the thermoelectric modules, to define a first channel for air flow in a first direction over one surface of the thermoelectric modules, and a second channel for air flow in a second direction opposite the first direction, over the other surface of the thermoelectric modules; and

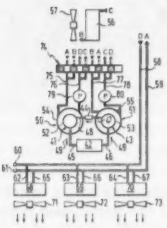
a thermal barrier, interposed between the first and second thermoelectric modules and between the cover plates, to minimize longitudinal heat conduction across the barrier in the heat pump modules.

4,065,937

METHOD TO TRANSFER HEAT OR REFRIGERANT AND HEAT PUMP FOR PRACTICAL APPLICATION OF THIS METHOD

Manfred R. Burger, Wolfratshauser Str. 45, 8023 Pullach; Ernst Gagel, Karwendelstrasse 49, 8000 Munich 70; Rudolf Kalmovicz, Stadtweg 25, 8059 Altenerding, and Alfred Prechtl, Lindenweg 6, 8082 Grafrath, all of Germany

Filed Jan. 21, 1976, Ser. No. 651,103
Claims priority, application Germany, Dec. 11, 1975, 2555887; Sept. 25, 1975, 2542728
Int. Cl.[2] F25D *17/06;* **F25B** *13/00*
U.S. Cl. 62—89 **3 Claims**



1. Method for the transfer of heat or refrigerant between two separate flows of fluid by means of a heat pump comprising a refrigeration cycle having an evaporator, a compressor, a condenser, and a regulating valve, including the steps of

a. providing heat exchange between the separate flows of fluid and said evaporator and condenser;

b. bringing one of said fluid flows during heating operation and prior to entering the evaporator into heat exchange in a first heat exchanger with the refrigeration cycle; and

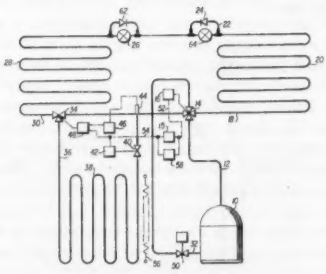
c. making said heat exchange in an area between the condenser and the regulating valve.

4,065,938

AIR-CONDITIONING APPARATUS WITH BOOSTER HEAT EXCHANGER

Kjartan A. Jonsson, Ballston Lake, N.Y., assignor to Sun-Econ, Inc., Ballston Lake, N.Y.

Filed Jan. 5, 1976, Ser. No. 646,711
Int. Cl.[2] F25B *13/00*
U.S. Cl. 62—160 **6 Claims**



1. Air-conditioning apparatus, comprising:

a first heat exchanger exposed to an environment to be air-conditioned;

a second heat exchanger exposed to an environment from or to which heat is to be absorbed or rejected;

refrigerant compressor means for pumping refrigerant through said apparatus, said compressor means having a suction port;

tubing means interconnecting said heat exchangers and said

compressor means for permitting refrigerant flow through said apparatus;

first valve means mounted in said tubing means for directing refrigerant flow through said apparatus;

a booster heat exchanger exposed to an environment from which heat is to be absorbed during the heating mode of the apparatus and connected to said tubing means to receive refrigerant flow at a location in said tubing means upstream of said suction port and to deliver said flow to a portion of said tubing means leading to said suction port; and

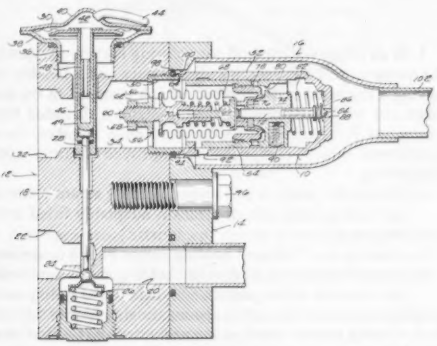
second valve means mounted in said tubing means for controlling flow through said booster heat exchanger as a function of temperature of said refrigerant at said suction port for connecting said booster heat exchanger to receive flow from said tubing means when said first valve means is in position to cause said apparatus to withdraw heat from said environment and for disconnecting said booster heat exchanger to prevent flow therethrough when said first valve means is in position to cause said apparatus to reject heat to said environment.

4,065,939

COMBINATION VALVE

James M. Thornbery, Milwaukee, and Charles D. Orth, Cedarburg, both of Wis., assignors to The Singer Company, New York, N.Y.

Filed Jan. 30, 1976, Ser. No. 653,897
Int. Cl.² F25B *41/04*
U.S. Cl. 62—217 **5 Claims**



1. A combination valve assembly for regulating refrigerant flow comprising,

a thermostatic expansion valve (TXV) having a body provided with an inlet and an outlet and a valve regulating flow from the inlet to the outlet, a return flow conduit through said body,

an evaporator pressure regulating valve (EPR) having a body provided with an inlet at one end and a pressure sensitive valve arrangement in the body controlling flow from the inlet to the exterior of the body,

the inlet end of said EPR being threaded into the TXV body in communication with the outlet of the return flow conduit with the EPR projecting from the TXV body,

a flat mounting plate fixed on the TXV body and having an aperture through which the EPR projects,

a drawn dome-like housing enclosing the portion of the EPR projecting through said plate aperture and sealingly fixed to said plate to form a chamber receiving the flow from the EPR, and

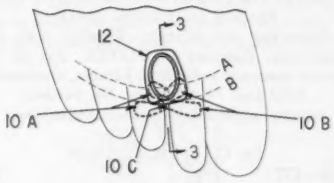
an outlet from the dome-like housing.

4,065,940

TOE RING BASE AND ORNAMENTAL TOE RING

Murray A. Gordon, 7357 Denny Ave., Sun Valley, Calif. 91352

Filed June 14, 1976, Ser. No. 695,739
Int. Cl.² A44C *15/00*
U.S. Cl. 63—2 **9 Claims**



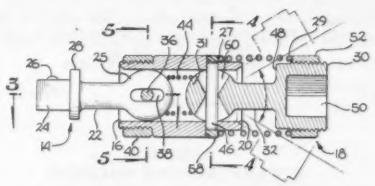
1. A toe ring base to be worn between two adjacent toes of the wearer, said toe ring base comprising: a pair of arcuate-shaped open crescent-like members formed in back-to-back relationship and having an inclined common central portion adapted to fit between two adjacent toes of the wearer and over the upper surface of the interconnecting inclined web of flesh therebetween, and further having respective upper and lower end portions shaped to extend across the upper surface and lower surface only of the same two adjacent toes of the wearer, and with the upper portion also partially resting on the foot immediately behind the toes, the central portion having substantial width in a parallel direction with respect to the extension of the toes to prevent twisting of the toe ring base between the toes, and the upper end portions of the arcuate-shaped members being positioned to the rear of the lower end portions.

4,065,941

UNIVERSAL JOINT

Sadashiro Aoki, Tokyo, Japan, assignor to Koto Sangyo Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1975, Ser. No. 578,173
Int. Cl. F16d *3/16*
U.S. Cl. 64—7 **7 Claims**



1. A universal joint adapted for use in in impact wrenches comprising:

a. Tubular housing having first and second ends;

b. A first ball joint having an imput shaft with the ball member disposed at one end thereof and an attaching head disposed at the other end thereof, said ball member of said first ball joint coupled to said tubular housing adjacent said first end thereof;

c. A second ball joint having an output shaft with a ball member disposed at one end thereof and a socket head disposed at the other end thereof, siad ball member of said second ball joint coupled to said tubular housing adjacent said second end thereof;

d. An external spring means disposed about said output shaft and journaled between said socket head and said second end of said housing, said external spring means for increasing the flexibility of said second ball joint;

e. On internal spring means within said tubular housing and journaled between said first and second ball members

thereby increasing the longitudinal flexibility of said universal joint.

4,065,942
PANTIES OR THE LIKE AND METHOD OF MANUFACTURING SAME

Bohumil Kejnovský, and Miroslav Kopečný, both of Trebic, Czechoslovakia, assignors to ELITEX, Zavody textilniho strojirenstvi generalni reditelstvi, Liberec, Czechoslovakia

Filed Dec. 17, 1975, Ser. No. 641,642

Claims priority, application Czechoslovakia, Dec. 22, 1974, 8872/74

Int. Cl.² A41B *9/02, 9/04*

U.S. Cl. 66—177 **11 Claims**

1. In an all-knitted construction for panty hose or similar garments, a first single-knit substantially tubular portion terminating upwardly in a first arcuate selvedge forming one edge of the garment waistband, a second single-knit substantially tubular portion terminating upwardly in a second arcuate selvedge forming an opposite edge of the garment waistband, first and second courses extending in parallel relation between and joined at respective first and second opposite ends thereof to the first and second selvedges to complete the waistband of the garment, and a continuous, arcuate, multi-knit body portion separate from the waistband and extending successively in a downward convex arc between, and joined at its respective opposite ends to, the first and second courses, a lower part of the continuous body portion defining the crotch area of the garment, the transversely opposite surfaces of the body portion being joined to the first and second selvedges.

4,065,943
ROTARY IRONING MACHINE

Jiri Dokoupil, Guckingen; Horst Zäpfel, Karlsruhe; Erich Gabelmann, Karlsruhe, and Helmut Breitwieser, Karlsruhe, all of Germany, assignors to Badische Maschinenfabrik GmbH, Germany

Filed May 27, 1976, Ser. No. 690,502

Claims priority, application Germany, May 30, 1975, 2524018

Int. Cl.² C14B *1/08*

U.S. Cl. 69—41 **23 Claims**

1. A machine for applying treatments such as ironing, embossing and the like to sheet materials, comprising:

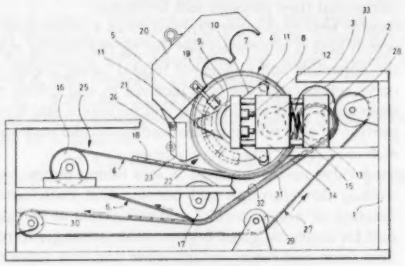
a rotatable, thin-walled hollow cylinder with a treating surface;

a pressure roller adjacent to the treating surface of the hollow cylinder;

a conveyor means passing between the treating surface and the pressure roller for guiding the sheet material therebetween;

radiant heating means associated with the hollow cylinder for heating the treating surface; and

a counter-pressure roller arranged within the hollow cylinder so as to roll on the internal wall surface of the hollow cylinder and, together with the pressure roller, serving to



guide the hollow cylinder, the conveyor means and the sheet material in a gap between the roller.

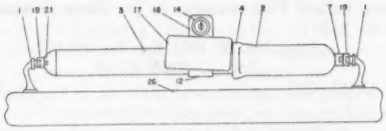
4,065,944
CYCLE PUMP SECURITY SYSTEM

James A. Webster, 100 W. 94th St., New York, N.Y. 10025

Filed Mar. 15, 1976, Ser. No. 667,085

Int. Cl.² E05B *73/00*

U.S. Cl. 70—58 **10 Claims**



1. In an improved method for securing a cycle pump where the pump is held between two pump pegs and a flexible tube, having a threaded male member, which is stored in the pump head and where the pump barrel contains a threaded female receptacle for receiving the threaded male member, the improvement which comprises an improved security system comprising

a. placing the pump in a C-shaped holding means containing lips having holes which means is adaptably fitted around the pump;

b. covering the C-shaped holding means with a cover means adaptably fitted to receive the holding means and contact the shoulder of the pump head via forward end lip means;

c. forcing the cover means against the shoulder of the pump;

d. causing the threaded male member of the flexible base to become wedged against one pump peg;

e. causing the threaded female receptacle of the pump barrel to become wedged against the other pump peg;

f. locking the C-shaped holding means by placing a lock through holes contained in the lips.

4,065,945
ANTI-THEFT DEVICE FOR HELMET AND HELMET FOR USE WITH THE DEVICE

Eric Jaulmes, Paris, France, assignor to Ateliers de la Motobecane, Pantin, France

Filed Aug. 2, 1976, Ser. No. 710,477

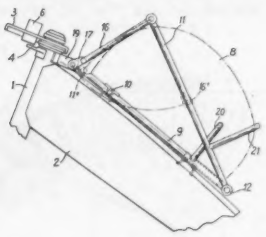
Claims priority, application France, Aug. 5, 1975, 75.24532; June 29, 1976, 76.19716

Int. Cl.² E05B *73/00*

U.S. Cl. 70—58 **9 Claims**

1. An anti-theft device for a helmet for use on a vehicle having a front fork, a frame and locking means for the front fork, the front fork being locked by the locking means whenever the front fork is positioned at a given angle with respect to the frame of the vehicle in order to prevent the vehicle from

being stolen, the device comprising, in combination: helmet-securing means for removably holding a helmet to the vehicle; and additional locking means coupled to said fork and con-



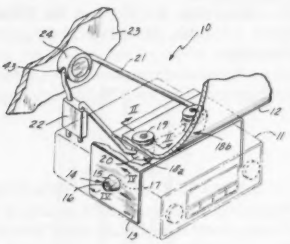
trolled by the position of said fork and cooperating with said helmet securing means for preventing removal of a helmet from said securing means whenever the fork is positioned at said given angle in its locked position.

4,065,946

TAMPER PROOF ATTACHMENT SYSTEM

Leslie M. Loynes; Darrel H. Walters, both of Angola, and Clarence A. Penick, Jr., Hudson, all of Ind., assignors to Brammall, Inc., Angola, Ind.

Filed Feb. 18, 1976, Ser. No. 658,907
Int. Cl.² E05B *73/00*
U.S. Cl. 70—58 **15 Claims**



1. A tamper proof attachment system comprising an anchoring means;

a cable and lock means attached to said anchoring means;

a mounting bracket having an aperture;

an attachment device means having a housing, a mounting bolt slidably received in an aperture located in one end of said housing, the head of said bolt loosely retained in said housing, and apertures in said housing through which said cable passes; and

a mounting member with a threaded aperture for receiving said mounting bolt, said mounting bracket being secured between said attachment device means and said mounting member, and said mounting bolt extending through the aperture of said mounting bracket and into the threaded aperture of said mounting member.

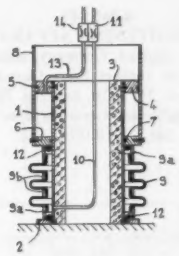
4,065,947

COMPENSATORY EXPANSION BELLOWS AND ITS PRODUCTION

Paul Mazier, 64, route de Geneve, Rillieux La Pape, France (69140)

Filed Dec. 3, 1976, Ser. No. 747,103
Claims priority, application France, Dec. 5, 1975, 75.37883
Int. Cl.² B21D *15/06*
U.S. Cl. 72—59 **2 Claims**

1. A device for manufacture, by the hydroforming process, of expanding bellows for pipe systems from metal collars, characterised in that it comprises, in combination, a rigid sleeve for placement inside said metal collar and forming an inner annular space therebetween, a fixed ring connected to the outer surface of one end of said sleeve, a displaceable ring mounted concentric to said sleeve and located between said fixed ring and the other end of said sleeve and arranged to slide with a sealing action thereon and contacting an edge of said metal collar, a cylindrical skirt concentric to said sleeve and connected to said displaceable ring and having a length so as to slidably contact said fixed ring with a sealing effect thereby



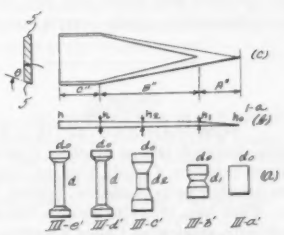
defining a closed variable volume annular chamber, means for admitting under pressure a fluid into the variable volume annular chamber formed between said sleeve and said skirt and bounded by said rings, and means to regulate the inflow and outflow of liquid into and out of the inner annular space between the collar to be shaped and the sleeve, whereby when said fluid is admitted under pressure to said variable volume annular chamber, said displacable ring and said skirt are displaced relative to said fixed ring thereby deforming the collar into a bellows.

4,065,948

ROLL-FORMING DIES IN A CROSS-ROLLING MACHINE

Hidehiko Tsukamoto, and Nobutaka Maeda, both of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1975, Ser. No. 628,558
Claims priority, application Japan, Nov. 25, 1974, 49-134211
The portion of the term of this patent subsequent to May 4, 1993, has been disclaimed.
Int. Cl.² B21H *1/18*
U.S. Cl. 72—108 **1 Claim**



1. Roll-forming dies in a cross-rolling machine, which can stretch by forging a shaft portion of a stepped cylindrical article having a large diameter reduction factor as a roll-forming operation by top portions of said dies proceeds, characterized in that:

each said die comprises: a die top portion contacting with a raw material rod during roll-forming and finishing operations thereof, whose height with respect to a reference surface of said die is successivelyand continuously increased in the direction of advance of the die from a start

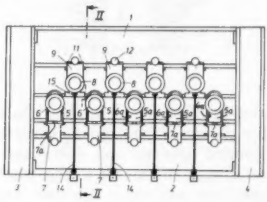
point of a depression-spreading portion of the die up to a start point of a finishing portion thereof; and also in that the width of a shaping inclined surface of the roll-forming die is gradually reduced in the direction of the advance of said die from the start point of the depression-spreading portion of said die up to the start point of the finishing portion, whereby a shaped surface having any arbitrary inclination angle can be self-generated.

4,065,949

STRAIGHTENING APPARATUS

Günther Morath, St. Ingbert, Germany, assignor to Moeller & Neumann GmbH, St. Ingbert, Saar, Germany

Filed Dec. 16, 1976, Ser. No. 751,358
Claims priority, application Germany, Dec. 18, 1975, 2557061
Int. Cl.[2] B21D *1/02*
U.S. Cl. 72—164 **4 Claims**



1. Straightening apparatus comprising: a frame defined by two uprights and upper and lower horizontal supports extending between said uprights, a plurality of vertically fixed upper straightening roll units slidably mounted on said upper horizontal support and including vertically non-adjustable upper straightening spindle housings, a cooperative plurality of lower straightening roll units slidably mounted on said lower horizontal support and including vertically adjustable lower straightening spindle housings, a plurality of tension members interconnecting the upper straightening roll units with said lower horizontal support, the upper end of each tension member being connected with its associated upper roll unit and being slidable therewith, and the lower end thereof being slidably connected with said lower horizontal support, and a tensioning device provided for each tension member arranged so that when loosened said tension members can be slid longitudinally of said upper and lower horizontal supports, and so that when tightened said upper and said lower horizontal supports are substantially rigidly interconnected thereby.

4,065,950

FORMATION OF ARTICLES

Derek Green, deceased, late of Aspatria, England, and Muriel Irene Green, executrix, Carlisle, England, assignors to United Kingdom Atomic Energy Authority, London, England

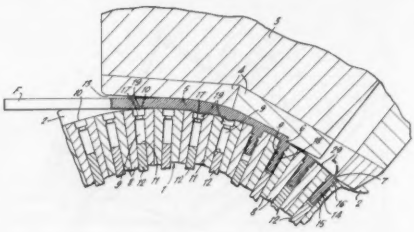
Filed Aug. 18, 1976, Ser. No. 715,498
Claims priority, application United Kingdom, Sept. 12, 1975, 37673/75
Int. Cl.[2] B21C *33/00*
U.S. Cl. 72—191 **15 Claims**

1. A process for the continuous and repetitive production of discrete articles of a desired cross-section from a deformable material, comprising the steps of

introducing the material into a moving and confined passageway,

causing the material to be drawn along the passageway by frictional drag of the moving passageway, and

by blocking said passageway at a position spaced from the position of introduction of the material, compressing said material and causing it to enter into successively presented



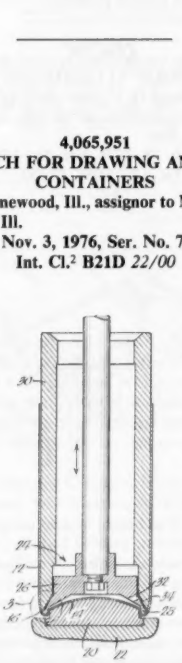
chambers shaped to produce articles of the desired configuration.

4,065,951

SPLIT PUNCH FOR DRAWING AND IRONING CONTAINERS

Seung W. Lyu, Homewood, Ill., assignor to National Can Corporation, Chicago, Ill.

Filed Nov. 3, 1976, Ser. No. 738,479
Int. Cl.[2] B21D *22/00*
U.S. Cl. 72—349 **7 Claims**



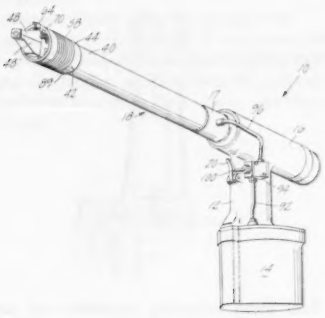
1. Apparatus for forming a wall of a circular container including a bottom wall and a sidewall comprising a die block adapted to engage an outer surface of said bottom wall and a cooperating die adapted to engage an inner surface of said bottom wall and sidewall, said cooperating die including a female portion cooperating with said die block and having a peripheral lip adapted to be placed in overhanging relation to the periphery of said die block, said female portion having a peripheral inwardly directed surface extending perpendicular to an axis for said female portion to define a peripheral ledge above said peripheral lip, said female portion having an inclined surface extending from an inner edge of said inwardly directed surface, said cooperating die including a cylindrical member having an end surface corresponding to and engaging said inwardly directed surface and said inclined surface so that said ledge defines a support extending perpendicular to the path of relative movement of said die block and said cooperating die.

4,065,952

PULL THROUGH BLIND RIVETING TOOL

David John Holloway, Aldridge, England, assignor to USM Corporation, Boston, Mass.

Filed Feb. 14, 1977, Ser. No. 768,178
Int. Cl.[2] B21J *15/34*
U.S. Cl. 72—391 8 Claims



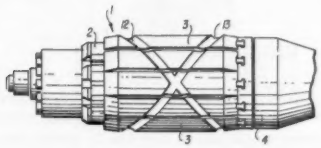
1. A blind riveting tool of the type including a reusable mandrel carrying a plurality of rivets to be successively set thereby, the tool comprising an elongated barrel, abutment members movably mounted on the barrel and closeable to engage a rivet head during rivet setting, means engageable with the stem of the mandrel to pull it in the setting operation, means for advancing the rivets along a stem of the mandrel to position the leading rivet beyond the abutment members, and means for urging the next to leading rivet and those behind it rearwardly so that the abutment members can close to embrace the mandrel behind the leading rivet without interference from the next one.

4,065,953

MECHANICAL TUBE EXPANDER

Hermann Josef Frentzen, Monchengladbach; Richard Gerretz, Viersen, and Ewald Henn, Monchengladbach, all of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Nov. 15, 1976, Ser. No. 742,040
Claims priority, application Germany, June 15, 1976, 2627172; July 16, 1976, 2632672
Int. Cl.[2] B21D *31/04*
U.S. Cl. 72—393 18 Claims



1. A mechanical expander for an elongated metallic pipe formed with an inside welded spiral seam and with an inside welded cross seam, comprising:

an expandable head constructed to allow a pipe to assume a circumjacent relationship therewith,

said head including an outer working surface,

means for displacing said working surface relative to the circumjacent pipe to impose an expanding force on the inside of the pipe,

a first spiral slot in said working surface formed and arranged to coincide with the welded spiral seam of the pipe, and

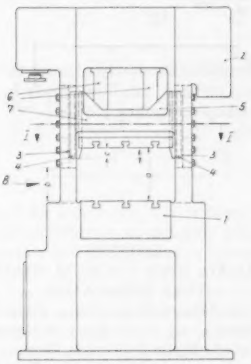
a second spiral slot in said working surface formed and arranged to coincide with the welded cross seam of the pipe.

4,065,954

RAM-GUIDING FRAME

Martin Gotz, Sersheim, Germany, assignor to Erich Grau Stanzwerk fur Elektrobleche, Sersheim, Germany

Filed Nov. 12, 1975, Ser. No. 631,064
Claims priority, application Germany, Nov. 20, 1974, 2454960
Int. Cl.[2] B21J *13/04*
U.S. Cl. 72—456 7 Claims



1. In a machine for processing stock comprising the combination of a frame construction having a base lower platen and crosshead members, tool holding means adapted to have a first tool detachably fixed thereto, and a ram having a tool holding portion adapted to have a second tool detachably fixed thereto, said ram adapted to move said tool holding portion towards said tool holding means, the improvement which resides in a ram guiding frame being symmetrical in cross-section and closely embracing said ram, said guiding frame having smaller dimensions than the frame construction and being centrally disposed relative thereto, within the depth thereof, said guiding frame comprising forward and rear members which leave free a first space through which said tool-holding means and said tool-holding portion are accessible, said forward and rear members having end side portions which leave free a second space through which said stock to be processed can be fed into position between said first and second tools, and ram guiding means terminating short of said second space, said guiding means detachably connected to said end side portions, to peripherally close said guiding frame above first and second spaces, and form an integral part thereof.

4,065,955

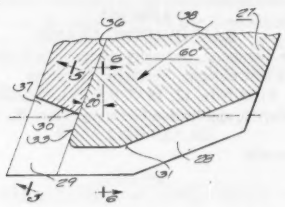
METHOD AND APPARATUS FOR FORMING A UNIFORM FELTING NEEDLE BARB

Edson Perkins Foster, Cato, Wis., assignor to Foster Needle Company, Inc., Manitowoc, Wis.

Filed June 15, 1976, Ser. No. 689,393
Int. Cl.[2] B21G *1/06*
U.S. Cl. 72—476 4 Claims

1. A tool for forming a barb in the blade of a felting needle, said tool including a swaging member having a throat-defining portion, a spur-defining portion, a face-forming portion, and a kickup controlling portion, said portions providing a cavity in the tool with the face-forming portion disposed between the throat-defining portion and the spur-defining portion and against which cavity the needle-blade material flows when in use whereby to create, in the fiber-engaging surfaces of a felting needle, a throat and a barb defined precisely by the outline of the cavity, said portions have smoothly contoured meeting edges between adjacent surfaces and having precisely

determined angles therebetween so that the blade material of the needle completely fills and substantially fully conforms to



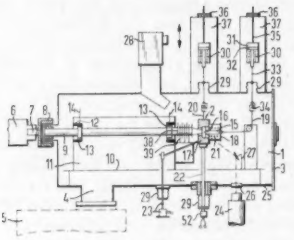
the shape and outline of the cavity adjacent the throat-, spur-, and face-defining portions, but flows freely in and only partially fills the kickup-controlling portion.

4,065,956

VARIABLE LOAD, HIGH VACUUM SHAFT BEARING TEST APPARATUS

Hermann Trattner, Munich; Kuno Saatze, Emmering, and Adolf Bauereiss, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 29, 1976, Ser. No. 681,725
Claims priority, application Germany, May 9, 1975, 2520719
Int. Cl.² G01M *13/04*
U.S. Cl. 73—9 **3 Claims**



1. An apparatus for testing a shaft bearing under high vacuum and variable loads, comprising:

a high vacuum chamber having peripheral walls;

a rotatable shaft carried on fixed, spaced-apart shaft support bearings within said chamber and having a magnetic clutch on one end thereof coupled through said wall of said chamber to a drive means, said shaft having a test end opposite said clutch end upon which is mounted said test bearing;

a test bearing mounting block carried circumjacent said test end of said shaft upon said test bearing;

a bearing friction torque measuring means in said chamber engaging said mounting block and restraining said block from rotational mvoement;

a tractive means for applying a load to said mounting block axially of said shaft, said tractive means extending through said vacuum chamber wall at a vacuum seal and to a load control means outside said chamber for varying said axial load on said test bearing;

the test end of the shaft extending in a stub axially beyond said test bearing opposite said fixed bearings; and

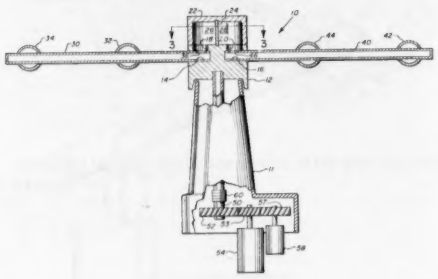
an induction coil spaced radially about the shaft stub, whereby the stub and test bearing may be heated.

4,065,957

FLUID SPEED INDICATING APPARATUS AND DENSITOMETER

John L. Bellman, Lancaster, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Filed Nov. 15, 1976, Ser. No. 742,142
Int. Cl.² G01F *1/50*; G01N *9/34*
U.S. Cl. 73—30 **5 Claims**



1. A fluid speed indicating apparatus and densitometer, comprising:

A pair of spaced generally coaxially aligned, tubular hollow arms mounted for rotation about an axis intermediate said arms;

means for rotating said pair of arms at a substantially constant angular speed about said axis;

two fluid pressure sensing means radially asymetrically located with respect to said axis and attached to respective arms of said pair of arms; and

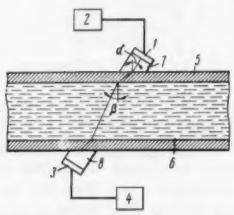
fluid pressure responsive means operatively connected to said two fluid pressure sensing means for sensing the steady state pressure differential between said two fluid pressure sensing means wherein said pressure differential is a function of rotational velocity and fluid density.

4,065,958

METHOD OF CONTROLLING PHYSICAL CHARACTERISTICS OF FLUID MEDIUM

Eleonora Dmitrievna Krylova, Beskudnikovsky pereulok, 32, korpus 2, kv. 32, and Nikolai Ivanovich Brazhnikov, ulitsa Bebelya, 3, korpus 11, kv. 48, both of Moscow, U.S.S.R.

Filed Oct. 18, 1976, Ser. No. 733,384
Int. Cl.² G01N *29/02*
U.S. Cl. 73—53 **2 Claims**



1. A method of controlling physical characteristics of a fluid medium by ultrasonic vibrations comprising the following steps: transmitting said ultrasonic vibrations into said fluid medium under control through a sound conducting medium within a pipe and through a wall of said pipe at an angle α, other than 90°, to said pipe exterior, said angle α being determined from the relationship:

$$\alpha = \arcsin C_o/(\sqrt{2} \cdot C)$$

C_o is the velocity of propagation of said ultrasonic vibrations in said sound conducting medium, and

C is the velocity of propagation of transverse ultrasonic vibrations within the material of said wall of said pipe, the frequency f of said vibrations being determined from the relationship:

$$f = (n \cdot C)/(\sqrt{2} \cdot d)$$

where

n is an integer, and

d is the thickness of said wall of said pipe; and

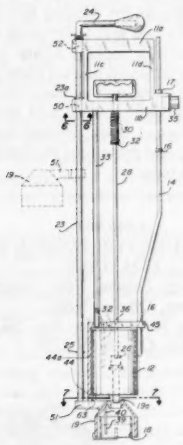
measuring parameters of said ultrasonic vibrations which have passed through said fluid medium under control and through another sound conducting medium, with the purpose of using the value thereof to determine the value of said characteristic being controlled.

4,065,959

PORTABLE VISCOMETER APPARATUS

Harold W. Richardson, Denver, Colo., assignor to Richmore Company, Denver, Colo.

Filed Dec. 8, 1976, Ser. No. 748,632
Int. Cl.² G01N *11/06*
U.S. Cl. 73—56 **6 Claims**



1. A field or portable viscometer, comprising:

a. portable elongated frame means;

b. support means at one end of said frame means for releasably supporting an open top disposable cup for receiving a fluid for sampling, the disposable cup having a single small opening the bottom thereof;

c. releasable support means on said frame means for holding a sample cup and for positioning the sample cup beneath the disposable cup for receiving fluid draining from the disposable cup;

d. drain means, including a predetermined sized openings, for draining the fluid from the disposable cup to the sample cup;

e. valve means for opening and closing said drain means; and

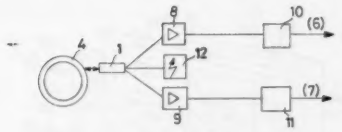
f. means for measuring the temperature of the fluid and for timing the flow of a known amount of the fluid through the sized opening.

4,065,960

METHOD AND APPARATUS FOR MONITORING THE OPERATION OF ULTRASONIC TESTING OF TUBES AND BARS

Werner Grabendorfer, Bensberg-Refrath; Herbert Vogt, Burgwedel; Harri Haacke, Dusseldorf; Harry Kuhn, Langenfeld; Reinhard Pawelletz, Erkrath-Unterbach, and Karl Ries, Mulheim, all of Germany, assignors to Krautkramer GmbH, Cologne and Mannesmann Aktiengesellschaft, Dusseldorf, both of, Germany

Filed Dec. 13, 1976, Ser. No. 749,603
Int. Cl.² G01N *29/04*
U.S. Cl. 73—627 **22 Claims**



1. The method for monitoring one or more transmit transducer probes and amplifiers in an ultrasonic pulse-echo immersion test apparatus when testing tubes or round bars comprising:

transmitting cyclically a search pulse of ultrasonic energy through a liquid coupling path into a workpiece having a curved surface, the angle of incidence of said ultrasonic energy upon the workpiece surface deviating from normal to cause the search pulse to propagate in a circumferential direction in the workpiece;

sensing the occurrence of scattering acoustic energy arising from the scattering of said search pulse energy at the curved workpiece surface;

converting said scattered energy to an electrical signal and amplifying said electrical signal, and

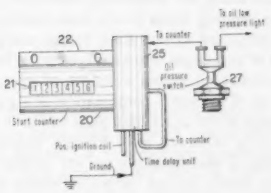
providing a signal when said scattered energy responsive electrical signal amplitude falls below a predetermined threshold value.

4,065,961

ENGINE ACTUATED INSTRUMENTATION AND A FUEL SAVING AND DIAGNOSTIC SYSTEM BASED THEREON

Robert T. Crew, Jacksonville, Fla., assignor to C & E Enterprises, Inc., Jacksonville, Fla.

Filed Jan. 11, 1977, Ser. No. 758,489
Int. Cl.² G01M *15/00*
U.S. Cl. 73—117.3 **10 Claims**



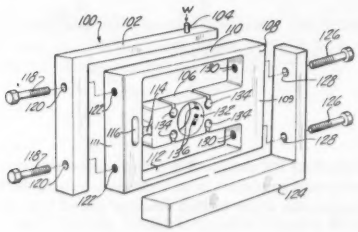
1. In a system for automotive fuel cost tracking and engine diagnostic determination, a visual indicating means and a first recording register having means to connect with an engine and other means to mount the same within the view of the driver, said indicating means being movable from a position showing imminent, and then actual departure of the engine from a lean part throttle mixture to a rich full throttle mixture as the throttle is opened and the load on the engine is increased to a degree wasting fuel, and, for counting each occurrence of such throttle operation, and a second recording register with means

connecting with the engine to record each engine start, said system including the step of determining accountability for poor miles per gallon by comparing the count on the first said register with the count on said second register.

4,065,962
LOAD CELL

Ralph S. Shoberg, Farmington Hills, Mich., assignor to GSE, Inc., Farmington Hills, Mich.

Continuation of Ser. No. 518,382, Oct. 29, 1974, abandoned. This application Mar. 19, 1976, Ser. No. 668,538
Int. Cl.[2] G01L *5/00*
U.S. Cl. 73—141 A **12 Claims**



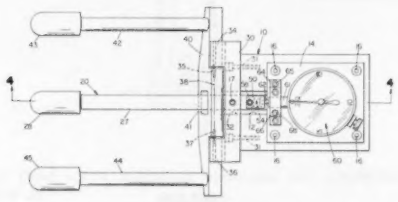
1. A load cell comprising: a solid body of high modulus of elasticity material having end portions and laterally opposite exterior faces; means for securing said end portions to a load receiving and reference structure respectively to tend to laterally displace said end portions by said load; a first major aperture bored through the faces of the body to define a first interior cylindrical surface fully bounded by said body and mediate said end portions; a plurality of second minor apertures bored through the faces of the body including opposed pairs of apertures disposed on either side of the longitudinal axis of said body and about said major aperture to define second interior surfaces adjacent but spaced from the first aperture; means allowing bending of the portions of the body mediate said minor and major apertures by said lateral displacement of said end portions, said means including means relieving said second interior surfaces to an edge of the body; said portions of said body mediate said first aperture and each of said oppositely disposed minor apertures defining first and second paths transmitting an applied load through the body on opposite sides of the longitudinal axis, each path having therein first and second stress concentrating flexure areas comprised of said portions of said body mediate said major and minor apertures; strain sensitive gage means mounted on said first interior surface at each of said flexure areas for producing resistance changes in response to the bending strain in said load transmitting paths as the body is subjected to said load; bridge circuit means connecting each of said gages into a bridge circuit having two legs each to be connected across a source of potential, each leg being made up of the series combination of a gage in one load path and a gage in the other load path which is directly opposite on the body whereby axial loading strains and bending moment strains of said flexure areas are additive in effect, the bridge circuit means having output terminals in the legs and between the gages thereof from which an electrical signal may be derived as an indication of the loading of said body.

4,065,963
TENSION METER

Erwin J. Saxl, Pin Hill, Harvard, Mass. 01451

Filed July 8, 1976, Ser. No. 703,591
Int. Cl.[2] G01L *5/04*
U.S. Cl. 73—144 **6 Claims**

1. A tension meter comprising
a base
a central feeler arm mounted on said base for movement of at least a portion thereof relatively thereto
sensing means mounted on said base for sensing movement of said central feeler arm movable portion
a pair of parallel side feeler arms positioned on opposite sides of said central feeler arm and generally parallel thereto and defining a side feeler arm plane
mounting means for said side feeler arms including a side feeler arm supporting plate mounted on said base for pivotal movement about an axis parallel to said side feeler arm plane, said plate being pivotally movable between an operative position in contact with said base and an inoperative position away from said base and supporting said side feeler arms for simultaneous pivotal movement on

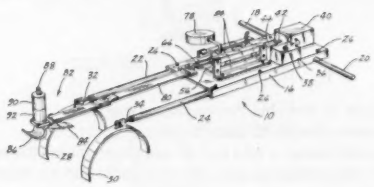


said base away from said central feeler arm into inoperative position for receiving a sheet or strand to be measured and toward said central feeler arm in operative position to measure the tension of said sheet or strand by moving the movable portion of said central feeler arm, and
releasable locking means for locking said plate in contact with said base with said side feeler arms in said operative position, said releasable locking means including a transverse pin member mounted on said plate and an operating lever pivotally mounted on said base, said operating lever being pivotally movable toward said base into operative position and having a hook portion engaging said pin member to move said plate into its operative position in contact with said base.

4,065,964
PORTABLE MACHINE FOR TESTING PROTECTIVE COATINGS

Richard D. Cunningham, Omaha, Nebr., assignor to Northern Natural Gas Company, Omaha, Nebr.

Filed Jan. 24, 1977, Ser. No. 754,027
Int. Cl.[2] G01N *3/56*
U.S. Cl. 73—150 A **10 Claims**



1. A portable machine for testing protective coatings, comprising,
a portable support means,
positioning means connected to said support means for positioning said support means relative to the object having the protective coating thereon,
a blade means for severing the protective coating from said object,
an elongated member connected at one end to said blade means,
power means on said support means operatively connected to the other end of said elongated member for moving said

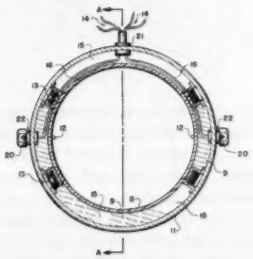
elongated member and said blade means towards said support means to sever the protective coating from said object,

and force readout means operatively connected to said power means for indicating the amount of force required to sever the protective coating from the object.

4,065,965
ELECTROMAGNETIC FLOWMETER HAVING REMOVABLE ELECTRODE LEADS

Thomas Liddon Ackerman, Farmington; Mathew Martin Barbato, and Eugene Vidmantas, both of Greece, all of N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed July 1, 1976, Ser. No. 699,670
Int. Cl.[2] G01F *1/58*
U.S. Cl. 73—194 EM **17 Claims**



1. An electromagnetic flowmeter having a flow tube, spaced electrodes, and electrode lead means in said flow tube:

said flowmeter also having bore means in said flow tube for having liquid flow therethrough, magnetic field coil means, and measuring circuitry external to said flow tube, said measuring circuitry being connected by said lead means to said electrodes for measuring voltages arising at said electrodes in response to a flow of conductive liquid through said bore means and between said electrodes while said magnetic field coil means creates a magnetic field in said flow, transverse thereto, and between said electrodes;

said flowmeter also having the improvement including conduit means in said flow tube, said conduit means having said electrode lead means removably contained therein; and said conduit means exiting from the flow tube to the exterior thereof for providing access to said electrode lead means from the exterior of said flow tube for removing said electrode lead means from said flow tube;

there being potting material encapsulating said magnetic field coil means and said conduit means, said electrode lead means being kept by said conduit means from being contacted by said potting material, and there being electrode housings in said flow tube, said electrode housings housing and providing external access to said electrodes, and keeping said electrodes from contacting said potting material; said electrode housings also having connections to said conduit means and having said electrode lead means extending through such connections and thereinto.

4,065,966
COMPRESSIBLE FLUID VELOCITY MEASURING INSTRUMENT

Crawford R. Meeks, Jr., 7883 Flight Place, Westchester, Calif. 90045

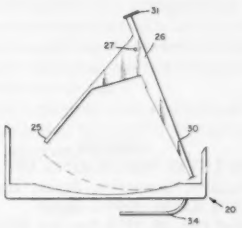
Continuation-in-part of Ser. No. 577,235, May 13, 1975, abandoned. This application Mar. 5, 1976, Ser. No. 664,276
Int. Cl.[2] G01F *1/28*
U.S. Cl. 73—228 **4 Claims**

1. A velocity measuring instrument comprising:

a case for immersion in a flowing fluid and having an entrance aperture for the entrance of said fluid, a variable flow area outlet aperture for the exit of said fluid, and a window;

a lightweight, counterweighted vane assembly pivotally mounted for rotation within said case and having a vane disposed adjacent said entrance aperture and responsive to said fluid entering therethrough, and having a pointer adjacent said window; and

a spring coupled to said vane assembly for controlling the movement thereof;



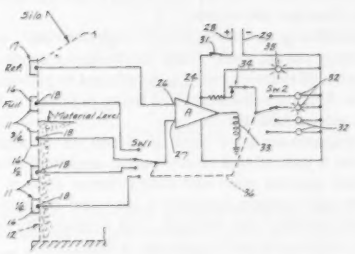
said variable flow area outlet aperture being contoured to vary the flow area of said outlet aperture substantially exponentially as a function of the position of said vane assembly for linearizing the movement of said vane assembly in response to the pressure of said fluid on said vane;

the inside of said case being contoured on both sides of said outlet aperture along the arc described by said vane as said vane assembly rotates to provide a variable clearance between said vane and the inside of said case to permit a larger area aperture at the high flow rate end.

4,065,967
SILO LEVEL INDICATING SYSTEM

John T. Beeston, Des Moines, Iowa, assignor to Robert E. Kirkpatrick, Humboldt, Iowa and Curtis C. Weaver, Polo, Ill.

Filed July 29, 1976, Ser. No. 709,765
Int. Cl.[2] G01F *23/22*
U.S. Cl. 73—295 **9 Claims**



1. A method for indicating the level of material in a silo or the like having an upstanding sidewall, comprising:

a. mounting a plurality of temperature sensors externally of the silo and in a heat transfer relation with the outside surface of the sidewall at vertically spaced portions thereon including mounting a first one of said sensors above the top level of material in the silo,

b. a thermal insulation enclosure for thermally insulating each of the sensors and the respective portions of the outside surface of the sidewall from the ambient temperature, whereby the temperature at a sensor outside the silo and the temperature inside the silo opposite the respective wall portion are substantially the same,

c. producing a reference signal indicative of the temperature at said first sensor and communicating said reference signal to a level indicator means,

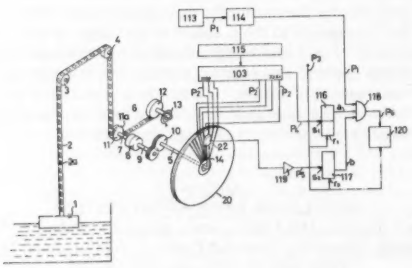
d. producing a signal indicative of the temperature at a selected one of the other sensors and communicating said signal to the level indicator means,
e. comparing said signal with said reference signal in the level indicator means, and
f. visually indicating the existence of a temperature difference between the temperatures at said first sensor and said selected sensor.

4,065,968

LIQUID LEVEL MEASURING APPARATUS

Yoshihiko Sunagawa, Kanagawa, Japan, assignor to Tokyo Keiso Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1976, Ser. No. 755,395
Claims priority, application Japan, Dec. 30, 1975, 50-159543
Int. Cl.[2] G01F *23/12*
U.S. Cl. 73—313 **3 Claims**



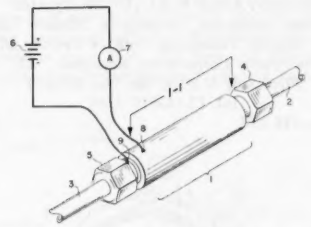
3. A liquid level measuring apparatus comprising:
a. a mechanism to convert the change in the liquid level into the rotational movement;
b. an insulating stationary disc, through the center of which a rotary output shaft of said mechanism extends, a large number of electric conductors designed to provide a magnetic field on being energized being provided radially on one side of said disc;
c. a magneto-sensitive head, provided on an arm which forms a part of said rotary output shaft and adapted to rotate together with said rotary output shaft in parallel with said electric conductors provided on said disc in order to detect the magnetic field provided by said electric conductors and to generate a stop pulse;
d. a clock pulse generator (**113**) and a counter circuit (**114**) to which a signal from said clock pulse is appled;
e. a decoder (**115**) to be operated by a signal from said counter circuit;
f. a pulse current output circuit (**103**) adapted to consecutively energize the electric conductors one by one provided on said disc on receipt of a signal from said decoder;
g. a flip-flop circuit (**116**) to which a reset pulse (**P3**) and a start pulse (**P4**) which is in synchronized relation with the energization of said basic electric conductor are applied;
h. a flip-flop circuit (**117**) to which a reset pulse (**P3**) and a stop pulse (**P5**) from said magneto-sensitive head are applied;
i. an "and" gate circuit to which outputs *a,b* each from said flip-flop circuits (**116**), (**117**) are applied; and
j. a digital indicator to be operated on receipt of an output from said "and" gate circuit.

4,065,969

LOW IMPEDANCE, HIGH CURRENT PRESSURE TRANSDUCER

Kendall L. Dinwiddie, 543 Jackson Drive, Palo Alto, Calif. 94303

Filed May 4, 1976, Ser. No. 682,999
Int. Cl.[2] G01L *9/06*
U.S. Cl. 73—727 **9 Claims**



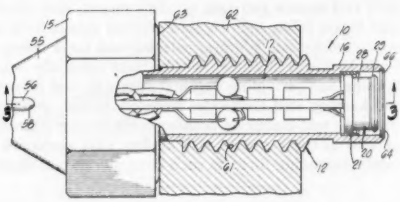
1. A device for producing a response proportional to pressure within a fluid-transporting conduit comprising:
a conductive inner tubular member having an inlet and an outlet adapted at the inlet and outlet to connect to the fluid transporting conduit;
a coating of piezo-conductive material applied to the exterior surface of the inner tubular member; and
a conductive outer tubular member closely fitting and contacting the coating of piezo-conductive material.

4,065,970

DIFFUSED SEMICONDUCTOR PRESSURE GAUGE

Leslie B. Wilner, Palo Alto, Calif., assignor to Becton, Dickinson Electronics Company, San Juan Capistrano, Calif.

Filed May 17, 1976, Ser. No. 687,204
Int. Cl.[2] G01L *9/06*
U.S. Cl. 73—727 R **29 Claims**

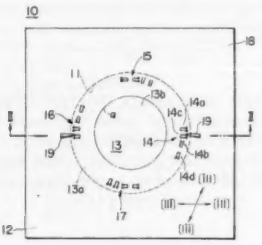


1. In a pressure transducer,
an edge restrained diaphragm of insulating material having portions of one surface thereof partially etched away to provide a thin portion having a pair of islands or thickened portions projecting therefrom to thereby define a longitudinal groove between the islands, whereby a flexure is formed between the islands, and
electrical strain gauge means formed by a dopant in solution at the flexure, whereby the electrical resistance of said gauge means varies as a function of the pressure across said diaphragm.

4,065,971
SEMICONDUCTOR PRESSURE TRANSDUCER

Michitaka Shimazoe; Kousuke Nakamura; Yasuo Matsushita; Satoshi Shimada; Kazuji Yamada, all of Hitachi, and Yukio Takahashi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed July 1, 1976, Ser. No. 701,531
Claims priority, application Japan, July 4, 1975, 50-81778
Int. Cl.² G01L *9/06*
U.S. Cl. 73—727 **6 Claims**



1. A semiconductor pressure transducer comprising:

a monocrystalline semiconductor diaphragm, only the perimeter of which is fixed to a base so that a central portion of the diaphragm produces in a radial direction thereof a first strain with a polarity opposite to that of a second strain produced in a portion defined between the central portion and the perimeter, in response to a mechanical pressure applied to the diaphragm; and

at least one set of semiconductor resistances of one conductivity type and comprising a first pair of resistances making up one pair of opposing arms of a resistance bridge and a second pair of resistances making up the other pair of opposing arms of said bridge;

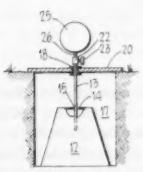
wherein the first and second pairs of resistances extend along the same crystal axis system of the diaphragm, the extending direction of the first pair of resistances forming an angle other than 90° with that of the second pair of resistances; and

wherein each semiconductor resistance formed in said diaphragm is formed only in said surface portion of said diaphragm defined between its central portion and its perimeter.

4,065,972
METHOD AND APPARATUS FOR UNDERGROUND DEPOSIT DETECTION

Fred F. Holub, Schenectady, N.Y., and H. Ward Alter, Danville, Calif., assignors to Terradex Corporation, Walnut Creek, Calif.

Continuation of Ser. No. 545,073, Jan. 29, 1975, abandoned. This application May 24, 1976, Ser. No. 689,710
Int. Cl.² G01N *1/26;* G01V *9/00*
U.S. Cl. 73—421.5 R **13 Claims**



1. A method of geophysical prospecting for underground minerals having specific gases associated thereto, said gases normally migrating to the surface of the earth, said method comprising the steps of:

a. Forming a plurality of shallow holes in the surface of the earth arranged in a predetermined pattern;

b. Planting a plurality of gas sample containers in said holes, each container having an inlet adjacent the bottom portion thereof and each container including a gas collection chamber having a second inlet in communication with the interior of said container and means for admitting said gases into said chamber at a predetermined flow rate;

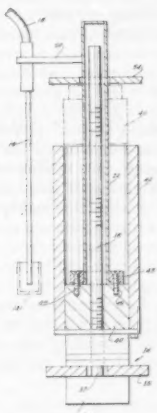
c. Retaining said containers in said holes for a predetermined time period to enable said chamber to collect a time integrated sample of said gases migrating into said container through said inlet over said time period; and

d. Removing said containers from said holes after said predetermined time period has elapsed for subsequent analysis of said time integrated sample.

4,065,973
LIQUID SAMPLER

Abraham Gordon, Teaneck, N.J., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Dec. 10, 1976, Ser. No. 749,556
Int. Cl.² G01N *1/12*
U.S. Cl. 73—423 A **4 Claims**

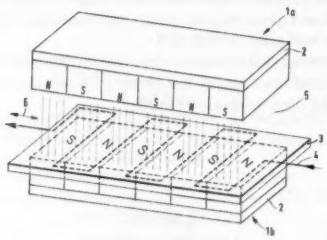


1. A sampler, comprising a liquid sampling probe, a first element, a second element having a vertical axis for movement therealong and threadedly cooperating with said first element, said second element supporting the probe for movement therewith, one of said elements comprising a nut, reversible means for rotating said first element in a first direction and a second direction to move said second element upwardly and downwardly, respectively, along said vertical axis and to rotate said second element to first and second angular positions, respectively, keying means for limiting the rotational movement of said second element during at least part of the upward and downward movement of said second element along said axis while in said first and second angular positions, first means and second means for limiting rotational movement of said second element to said first and second angular positions, respectively, and during rotation of said first element in said second direction, and means for positioning said second means upon rotation of said second element to said second angular position and operation of said reversible means to rotate said first element in said second direction.

4,065,974
SPRING SYSTEM COMPRISING AN ADJUSTABLE SPRING

Hartmut Euer, Gauting, and Gerhard Bartek, Munich, both of Germany, assignors to Apparatebau Gauting GmbH, Gauting, Germany

Filed Nov. 20, 1975, Ser. No. 633,846
Claims priority, application Germany, Nov. 22, 1974, 2455355; May 13, 1975, 2521175
Int. Cl.[2] G01D *11/10*
U.S. Cl. 73—430 **4 Claims**



1. A spring system having an adjustable spring force comprising at least one magnet, said magnet having a magnetic field, at least one conductor passing direct current being disposed in said magnetic field, said conductor being displaceable relative to said magnet, said magnet being formed by a number of pole pairs disposed along the path of displacement of said conductor, each of said pole pairs enclosing an air gap, having a predetermined cross-section and a predetermined spacing from another of said pole pairs, said direct current carrying conductor displaceable in said air gaps being a wire bent substantially in undulative form in the direction of displacement, and coiled so as to form a number of windings disposed one behind the other in the direction of the displacement, said number of windings being equal to said number of pole pairs, each of said windings having at least one turn and having substantially the same cross-section and spacing from another of said windings as the cross-section and spacing of each of said pole pairs, first and second magnetic fluxes being generated by the direct current in said wire and by the magnetic pole pair having said wire disposed therebetween, respectively, said first and second magnetic fluxes being of equal directions, said second fluxes between poles of adjacent pole pairs being opposite to one another, the undulating wire having a half-wave spacing substantially equal to the spacing between adjacent pole pairs.

4,065,975
APPARATUS FOR MEASURING THE SLIP OF LOCOMOTIVE WHEELS AND PREVENTING SLIDING THEREOF

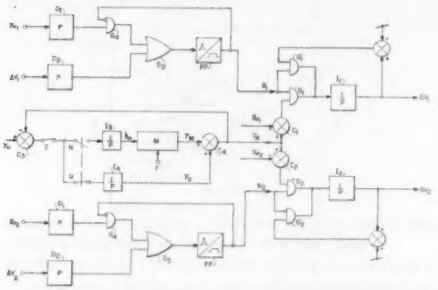
Jean Giessner, Villneuve le Comte, France, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed June 14, 1976, Ser. No. 695,539
Claims priority, application Switzerland, June 13, 1975, 7669/75
Int. Cl.[2] G01P *3/56*
U.S. Cl. 73—510 **6 Claims**

1. Apparatus for measuring wheel slip and to prevent excessive sliding of the wheels of a locomotive and which produces a control signal in accordance with the variation in velocity between translatory speed of the locomotive and the circumferential velocity of sliding sheels, said control signal being used for governing the speed of the locomotive, said apparatus comprising:

a system including a coupling loop for determining the effective acceleration of the locomotive, said system comprising a comparator into one input of which is fed a signal corresponding to the acceleration of a wheel and wherein the output signal from said system is fed back to the other input of said comparator and wherein the following seriately connected circuit components are included between said comparator and the output of said system.

1. a switch which opens only in the event of wheel slip,
2. an integrator with output storage,
3. a multiplier having one input thereof connected to the output store of said integrator and to the other input of which is connected a signal derived from the locomotive motor current and which is proportional to its



pulling force, said system being in balance when said switch is in its closed state and which is indicative of an effective acceleration of the locomotive equal to that of the wheel acceleration, means for integrating the difference between a signal

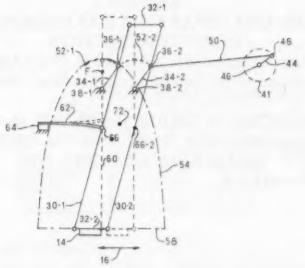
representing the output from said system by which the effective acceleration of the locomotive is obtained and a signal representative of wheel acceleration to produce said control signal for governing the speed of the locomotive,

and means for blocking transmission of said difference signal to said integrating means in the absence of wheel slip.

4,065,976
MECHANICAL SCANNING METHOD AND APPARATUS FOR ULTRASONIC IMAGING, OR THE LIKE

Jon C. Taenzer, and Steven H. Johnson, both of Palo Alto, Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Sept. 20, 1976, Ser. No. 724,330
Int. Cl.[2] G01N *29/00;* **F16H** *21/16*
U.S. Cl. 73—633 **21 Claims**



1. A scanning mechanism for mechanically scanning ultrasonic transducer means, or the like, comprising,

a parallelogram linkage comprising a pair of parallel arms interconnected by a pair of parallel connecting links pivotally connected thereto,

means for rigidly attaching transducer means to one of the connecting links, and

means for driving the parallelogram linkage with relative

pivotal movement of the parallel arms and connecting links in the plane of the linkage for scanning movement of the one connecting link and attached transducer means.

5. A mechanism for converting arcuate motion to straight line motion comprising,

an arm,

means for supporting the arm adjacent one end thereof for arcuate motion along a portion of a generally elliptical path adjacent a focus of the ellipse,

means for constraining the arm intermediate the opposite ends thereof to movement along a substantially straight line path along the major axis of the ellipse whereby the arm opposite said one end is movable along a substantially straight line path along the minor axis of the ellipse.

4,065,977

RECIPROCATING VIBRATING DRIVE

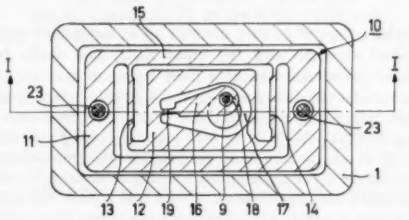
Leo Buzzi, and Peter Malobabic, both of Klagenfurt, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 8, 1976, Ser. No. 703,448

Claims priority, application Austria, July 28, 1975, 5835/75

Int. Cl.[2] F16H *21/18*

U.S. Cl. 74—49 **7 Claims**



1. A vibratory bridge assembly for use in producing reciprocating vibratory movement of a load in response to rotation of an input eccentric, which comprises a plate, means for mounting said plate to allow reciprocating movement thereof in a given direction, means for connecting a load to said plate for movement the same as the plate movement, and means for moving said plate in reciprocating motion in response to rotation of an eccentric pin having a longitudinal axis, said mounting means comprising a frame having two attachment portions and two elongated hinge strips each having a first end and a second end, said hinge strips being elongated in a direction transverse to the longitudinal axis of said eccentric pin and transverse to said given direction of reciprocating movement, the first end of each hinge strip being integrally connected to the plate and the second end of each hinge strip being integrally connected to its respective frame attachment portion.

4,065,978

SYNCHRONIZED DRIVE AND CABLE HANDLING SYSTEM FOR A ROTATIONAL MACHINE ELEMENT

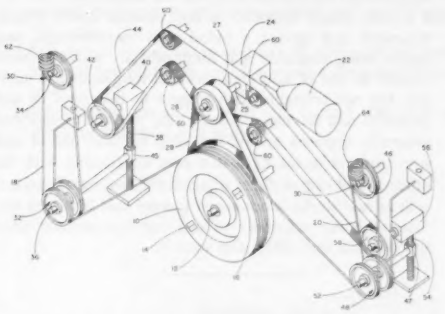
Henry Meresz, Wheeling, and Michael N. Tranquilla, Elmhurst, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Sept. 7, 1976, Ser. No. 720,564

Int. Cl.[2] F16C *1/02*

U.S. Cl. 74—82 **12 Claims**

1. In a machine of the type incorporating a driven rotational element, upon which element are carried devices to which a medium is required to be supplied through cables attached at one end thereto, the other end of said cables terminating externally of the rotational element, an improved synchronized drive and cable handling system for the rotational element by which the cables are smoothly and reliably fed and wound thereon at a substantially constant tension during rotation of the element, said improvement comprising: a plurality of pulleys grouped into first and second spaced-apart idler pulley sets, the number of pulleys in each said set differing by one, and about which pulley sets a cable is wound to form an elongated loop intermediate the cable ends with one end of the cable extending from said loop and being attached to a device carried by the rotational element, and with the other end of the cable extending from said loop and terminating externally of the rotational element; all pulleys of said first pulley set being disposed about a first axis; all pulleys of said second pulley set being disposed about a second axis; translating means for varying the distance between said first and second axes and thus



varying the length of said elongated loop, whereby the cable can be played-out and taken-in with respect to the rotational element; a drive means for causing rotation of the rotational element; and means for controlling the operation of said translating means such that said translating means respectively plays-out and takes-in measured lengths of cable in synchronism with the speed and direction of rotation of the rotational element.

4,065,979

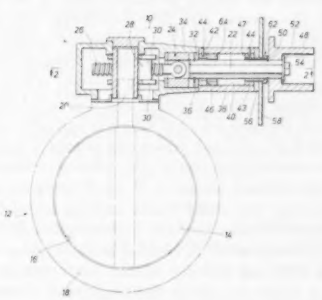
TRAVELING NUT STOP ASSEMBLY

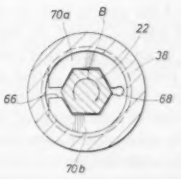
Henry R. Killian, Sugarland, Tex., assignor to Keystone International, Inc., Houston, Tex.

Filed Mar. 22, 1976, Ser. No. 669,141

Int. Cl.[2] F16H *27/02*

U.S. Cl. 74—89.15 **12 Claims**





1. A stop assembly for limiting relative rotation comprising:

an inner member;

an outer member coaxial with and at least partially surrounding said inner member, said outer member being at least partially radially spaced from said inner member to form an elongate annular space between said members;

means defining a first stop surface facing axially inwardly at one end of said annular space;

means permitting relative rotation but preventing relative longitudinal movement between said members;

and a stop sleeve disposed in said annular space coaxial therewith and having a radial split therethrough, said sleeve being rotatable and longitudinally movable with respect to one of said members and longitudinally movable but not rotatable with respect to the other of said members and having a second stop surface at one end generally opposed to said first stop surface, one of said stop surfaces including a stop area engageable with the other of said stop surfaces adjacent the trailing side of said split as said sleeve is advanced toward said first stop surface, with the remainder of said one stop surface being spaced from said other stop surface.

4,065,980

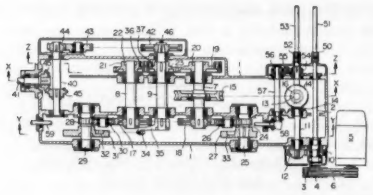
DRIVING METHOD AND APPARATUS

Shiro Ichinose, 11-8, 4-chome, Shinohara Kita, Nada, Kobe, Hyogo, Japan

Filed June 14, 1976, Ser. No. 695,391

Int. Cl.[2] F16H *57/00, 55/04*

U.S. Cl. 74—404 **10 Claims**



5. An apparatus for driving an output shaft in the normal direction and the reverse direction alternately, which comprises a partially toothed wheel C connected to the output shaft, a normal direction-driven, partially toothed wheel A which is engaged with said partially toothed wheel C and driven and rotated in one direction and a reverse direction-driven, partially toothed wheel B which is engaged with said partially toothed wheel C and driven and rotated in a direction reverse to the rotation direction of said partially toothed wheel A, said partially toothed wheels A, B and C being disposed in such a relationship that said partially toothed wheel C is engaged alternately with said partially toothed wheel A and with said partially toothed wheel B, wherein a cam follower is fixed to the output shaft and first and second cams (*b*) and (*a*) are mounted, each of which is driven and rotated at a certain speed and is capable of being engaged with said cam follower, said cam follower and said first and second cams **8***b*) and (*a*) being disposed in such a relationship that the time of termination of the normal rotation of the output shaft by said normal direction-driven, partially toothed wheel A, the cam follower is engaged with a cam groove of said first can (*b*) to reduce the speed of the normal rotation of the output shaft, stop the output shaft and accelerate the output shaft to turn in the reverse direction, and at the time of termination of the reverse rotation of the output shaft by said reverse direction-driven, partially toothed wheel B, the cam follower is engaged with a cam groove of said second cam (*a*) to reduce the speed of the reverse rotation of the output shaft, stop the output shaft and accelerate the output shaft to turn in the normal direction.

4,065,981

GEARING

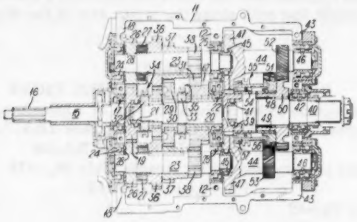
Eric Albert Whateley, Huddersfield, and Eric Alexander Pengilly, Newbury, both of England, assignors to David Brown Gear Industries Limited, Huddersfield, England

Continuation of Ser. No. 148,328, June 1, 1971, abandoned. This application Aug. 7, 1974, Ser. No. 495,415

Claims priority, application United Kingdom, June 5, 1970, 27423/70

Int. Cl.[2] F16H *3/08, 57/00*

U.S. Cl. 74—410 **3 Claims**



1. Change-speed gearing comprising an input shaft, an output shaft co-axial with the input shaft, said shafts being mounted for rotation about a fixed common axis only, two countershafts parallel to said shafts, a double-helical gear assembly rotatably mounted on said output shaft by means providing limited axial float of said assembly along said output shaft so as to share in fixed proportions the transmission of torque between the countershafts, a single-helical gear on one countershaft meshing constantly with that zone of the double-helical gear assembly having helical teeth of one hand, a single-helical gear on the other countershaft meshing constantly with that zone of the double-helical gear assembly having helical teeth of the other hand, gearing constantly drivably connecting said input shaft to both of the countershafts and comprising a gear fixed on said input shaft meshed constantly with a gear fixed on each of said countershafts, and clutch means for selectively drivably connecting said output shaft either directly to said input shaft or to the double-helical gear assembly without impeding the axially floating action of said assembly.

4,065,982

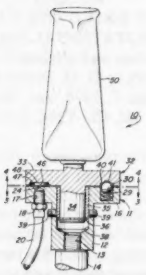
TRANSMISSION GEAR SHIFT CONTROL

Gerald W. Wenger, 1420 Church Ave., Wisconsin Rapids, Wis. 54494

Filed Apr. 5, 1976, Ser. No. 673,907

Int. Cl.[2] B60K *20/00;* **F16K** *11/02*

U.S. Cl. 74—473 R **5 Claims**



1. A transmission shift control assembly, comprising

a gear shift lever including an upstanding elongated rod,

a first body member mounted to the upper end of said rod,

a second body member rotatably mounted to said first body

member for rotation about an axis aligned with the axis of said rod,

means for connecting a plurality of transmission control fluid lines to said first body member,

valve means disposed in said body members and responsive to the relative angular positions of said body members for interconnecting selective ones of said fluid lines,

an elongated hand grip member fixedly secured to said second body member and extending upwardly therefrom with the axis of said hand grip member being aligned with the axis of rotation of said second body member,

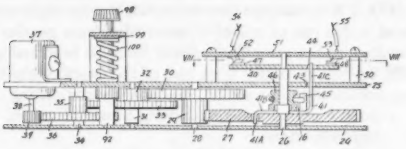
whereby said hand grip member may be grasped by the user with the fingers encircling said axis and with the inside of the wrist facing in a horizontal direction to facilitate the simultaneous rotation of said second body member and movement of said rod.

4,065,983

DEVICE FOR CHANGING THE GEAR RATIO OF A VARIABLE SPEED GEAR MOUNTED TO A BICYCLE

Yasuo Mimura, Kawaguchi, Japan, assignor to Maruishi Cycle Industries, Ltd., Tokyo, Japan

Filed Mar. 22, 1976, Ser. No. 669,073
Int. Cl.[2] B60K *20/16*; B62M *9/04*; F16H *1/00*
U.S. Cl. 74—625 **3 Claims**



1. An electromechanical device for changing the gear ratio of a variable speed gear mounted to the hub of the rear wheel of a pedal cycle, comprising an essential section to be mounted to the frame adjacent the rear wheel of the cycle, a manual switch to be mounted to the steering handle, and a flexible wire for connecting the essential section and the variable speed gear, said essential section comprising an electric power source, a reversible motor, a main shaft of a spur gear to be rotated through gear mechanisms by said motor, a switch disc mounted on said main shaft, means for connecting said spur gear and said switch disc, means for securing one end of said flexible wire to said connecting means, two arcuate conductors provided on the face of said switch disc, an intermediate conductor interposed between said arcuate conductors, a conductor for connecting the positive side of said power source through a first contact to one of said arcuate conductors, a second conductor for connecting the negative side of said power source through a second contact to other of said arcuate conductors, and a plurality of conductors for connecting said arcuate and intermediate conductors to said manual switch.

4,065,984

INTERNALLY ACCOMMODATED SPEED CHANGE MECHANISM APPLICABLE TO A BICYCLE

Kazuo Nakajima, Kodaira, Japan, assignor to Xenoah, Co., Yamato, Japan

Filed Apr. 17, 1975, Ser. No. 569,015
Claims priority, application Japan, Jan. 25, 1975, 50-10725
Int. Cl.[2] F16H *3/44, 5/12*
U.S. Cl. 74—750 B **9 Claims**

1. An internally accommodated speed change mechanism applicable to a bicycle, comprising in combination:

a hub axle;

a hub body mounted for free rotation on said hub axle;

a first planetary gear mechanism mounted on said hub axle within said hub body;

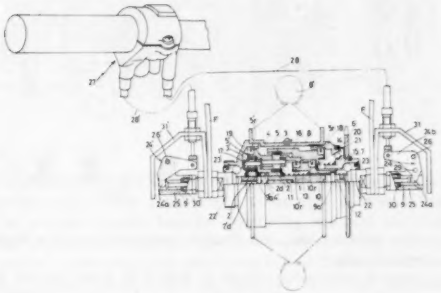
a second planetary gear mechanism mounted on said hub axle within said hub body;

said first planetary gear mechanism having a first sun gear freely rotatable on said hub axle, a first planetary gear in engagement with said first sun gear, and a first ring gear in engagement with said first planetary gear;

said second planetary gear mechanism having a second sun gear freely rotatable on said hub axle, a second planetary gear in engagement with said second sun gear, and a second ring gear in engagement with said second planetary gear;

a first carrier connected to said second ring gear and retaining said first planetary gear for rotation about said first sun gear;

ratchet means associated with said second ring gear and meshing with said hub body;



a sleeve operatively associated with a drive sprocket and freely rotatable on said hub axle, said sleeve being axially slidable on said hub axle;

first means on said sleeve to selectably engage said first carrier when said sleeve is at a certain axial position on said hub axle, so that said first carrier and said first planetary gear are rotated by rotation of said drive sprocket;

a first speed change rod disposed in said hub axle for selective axial movement and operatively associated with said sleeve to axially move said sleeve to place said first means in said selectable engagement;

a second speed change rod disposed in said hub axle for selective axial movement independently of said first speed change rod; and

means associated with said second speed change rod to selectably connect either said first sun gear or said second sun gear to said hub axle in response to a certain axial position of said second speed change rod.

4,065,985

OIL PRESSURE CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION SYSTEM

Yutaka Taga, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 7, 1975, Ser. No. 620,345
Claims priority, application Japan, Dec. 23, 1974, 49-147899
Int. Cl.[2] B60K *41/18*
U.S. Cl. 74—869 **15 Claims**

1. An oil pressure control system for an automatic transmission system which includes a fluid torque converter, a transmission gear and friction engaging means for establishing a selected transmission engagement in said transmission gear, comprising:

a source of oil pressure;

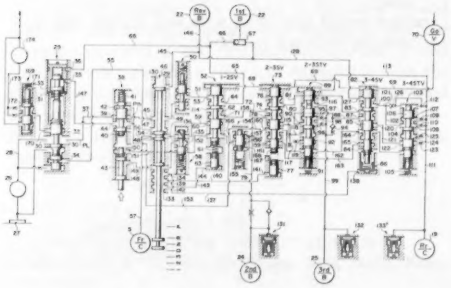
a line pressure regulating valve which generates a line pressure from the oil pressure of said source, said line pressure being regulated to be suitable for operating said friction engaging means;

a throttle pressure regulating valve which generates a throt-

tle pressure from said line pressure, said throttle pressure increasing as the engine torque increases;

a governor pressure regulating valve which generates a governor pressure from said line pressure, said governor pressure increasing as the vehicle speed increases;

a plurality of speed shift valves which are shifted according to a balance of said governor pressure and said throttle pressure so as to change over the supply of oil pressure to said friction engaging means for shifting the transmission between lower and higher speed stages, at least one of said speed shift valves having a detent port adapted to be supplied with a detent pressure which counteracts said governor pressure to bias a balancing point of said gover-



nor pressure and said throttle pressure toward a higher speed range;

a manual shift valve which is shifted by hand among forward, reverse, neutral and low speed ranges for effecting a selected transmission, said manual shift valve having a low speed port or ports adapted to be opened when it has been shifted to a low speed range so as to provide said detent pressure to said detent port or ports of said speed shift valve or valves; and

a detent pressure regulating valve which generates a specific reduced pressure from said line pressure, said reduced pressure serving as said detent pressure supplied to said detent port or ports of said speed shift valve or valves.

4,065,986

SELF-ADJUSTING WRENCH

Daniel H. Meggs, 4313 Vista Largo, Torrance, Calif. 90505, and Janos Beny, 202 Calle de Sirenas, Redondo Beach, Calif. 90277

Filed Mar. 19, 1976, Ser. No. 668,472
Int. Cl.² B25B *13/18*
U.S. Cl. 81—128 **7 Claims**

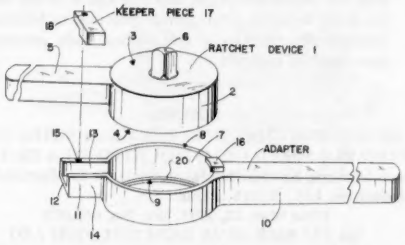
1. An automatic self-adjusting wrench comprising a body member, a pair of jaw members having portions fitting within the body member for longitudinal movement within the body member, the jaw members having confronting jaw faces movable toward and away from each other in response to inward longitudinal movement of the jaw members within the body, the body having camming surfaces positioned to engage the jaw members, the said jaw members having portions in juxtaposed relationship to said camming surfaces whereby inward movement of said jaw members with respect to the body causes the jaw members to be cammed toward each other for gripping, and resilient means normally resisting inward movement of the jaw members in the said body the said jaw members including flat faces adapted to engage against flat surfaces of a fastener element, said flat faces each lying at an acute angle to their respective jaw faces such that force exerted against the fastener element causes the jaw members to move towards each other.

4,065,987

T LEVER ADAPTER

Charles L. Rager, Philadelphia, Pa., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 9, 1977, Ser. No. 775,710
Int. Cl.² B25G *1/00*
U.S. Cl. 81—177 A **2 Claims**



1. A T lever adapter for a ratchet device having a cylindrical head with a pair of spaced substantially planar parallel bases, a handle member extending radially from the head and a projection extending axially from one of the bases of the head for accommodation in a socket, said adapter comprising

a hollow cylindrical ring having a pair of spaced circular opposite edges;

a handle member extending radially from the ring;

a trough-like member extending radially from the ring diametrically opposite the handle member, said trough-like member having a substantially square U cross-section extending from and opening into the ring;

a retainer piece affixed to the handle member and extending beyond an edge of the ring for retaining the head of a ratchet device coaxially positioned in the ring with the handle member of said ratchet device accommodated for part of its length in the trough-like member; and

a keeper piece removably affixed to the trough-like member for keeping the handle member of the ratchet device in said trough-like member.

4,065,988

UNITARY WORK CHANGER FOR A MACHINING CENTER

Earl R. Lohneis, Milwaukee, Wis., and John J. Schachte, West Hartford, Conn., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Division of Ser. No. 311,851, Dec. 4, 1972, Pat. No. 4,013,176, which is a continuation of Ser. No. 12,057, Feb. 17, 1970, abandoned. This application Oct. 7, 1976, Ser. No. 730,530
Int. Cl.² B23B *15/00*
U.S. Cl. 82—2.7 **2 Claims**

1. In a machine tool having a frame;

a tool operator and a work station carried by said frame for relative movement to perform a machining operation;

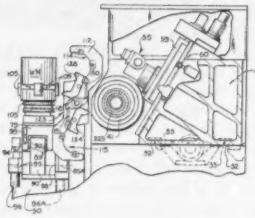
a loading station positioned in a predetermined spaced relationship to said work station for supporting workpieces to be worked upon by said work station and to receive completed workpieces;

a rotary transfer arm rotatably carried by said frame and connected to be rotated by power for transferring the workpieces between said work station and said loading station;

a cam connected to move with said rotary transfer arm; and

a rate change means actuated by said cam to regulate the rate

of acceleration and deceleration of said transfer arm during the transfer movement so that the transfer operation



will be completed in minimum time without excessively straining the associated structure.

4,065,989

ARRANGEMENT FOR FEEDING ROD SHAPED WORKPIECES TO A MACHINE TOOL

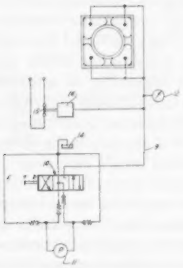
Holger Scheler, Klausdorf, Schwentine, Germany, assignor to Hagenuk Vormals Neufeldt & Kuhnke GmbH, Kiel, Germany

Continuation of Ser. No. 594,285, July 9, 1975, Pat. No. 4,006,654. This application July 20, 1976, Ser. No. 706,944

The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.

Int. Cl.[2] **B23B** *25/00*

U.S. Cl. 82—38 A **17 Claims**



1. In an arrangement for feeding rod-shaped workpieces to a machine tool, a combination comprising an elongated guide member for accommodating a respective workpiece therein; support means arranged along said guide member; means for mounting said guide member on said support means with a spacing therefrom, including a plurality of elastically yieldable members in said spacing along said guide member, each having an enlarged space for accommodating a pressurized fluid the pressure of which determines the oscillation-damping properties of the respective elastically yieldable member; and means for so controlling the pressures in said enclosed spaces that said elastically yieldable members efficiently damp the oscillations to which said guide member is subjected during the operation of the arrangement for optimally preventing the transmission of such oscillations between said guide member and said support means at each particular oscillation frequency.

17. In an arrangement for feeding rod-shaped workpieces to a machine tool, a combination comprising an elongated hollow guide member for accommodating a respective workpiece therein; support means arranged along said guide member and surrounding the same with spacing; and a plurality of elastically yieldable hollow members filled with pressurized fluid and arranged along said guide member in said spacing, said hollow members being operative for supporting said guide member on said support means and for damping oscillations to which said guide member is subjected during the operation of the arrangement so as to prevent transmission of the oscillations to said support means.

4,065,990

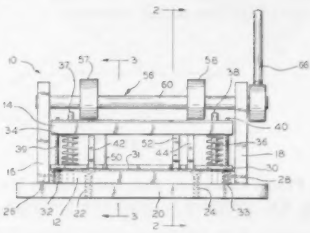
METHOD AND APPARATUS FOR PREPARING FILM FOR EXPOSURE WITH A FILM FONT

Ronald D. Edhlund, Mount Prospect, Ill., assignor to American Photo-Graphics Corporation, Arlington Heights, Ill.

Filed July 19, 1976, Ser. No. 706,786

Int. Cl.[2] **B26D** *7/18;* **B26F** *1/12*

U.S. Cl. 83—133 **2 Claims**



1. Apparatus for perforating pieces of film in preparation for exposure with a film font, which comprises: a base; a first platen mounted on said base for supporting said film, said first platen defining a plurality of apertures; a cover plate defining a plurality of apertures and adjustably mounted above said first platen; spring means extending between said base and said cover plate through said first platen; a second platen adjustably mounted above said cover plate; spring means extending between said cover plate and said second platen; a plurality of punch means fixedly mounted to the bottom of said second platen; a pair of walls attached to opposite sides of said first platen; shaft means rotatably fixed between said walls above said second platen; at least one eccentric mounted on said shaft means and positioned to bear against said second platen; and means for rotating said shaft to force said second platen toward said first platen and drive said punch means through the apertures of said cover plate, film and the apertures of said first platen.

4,065,991

APPARATUS FOR FEEDING STRIPS OF PANELS

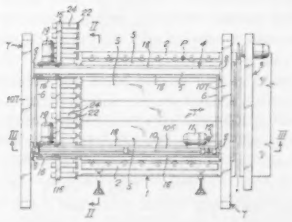
Gino Benuzzi, Bologna, Italy, assignor to Giben Impianti S.p.A., Pianoro (Bologna), Italy

Filed Dec. 17, 1976, Ser. No. 751,574

Claims priority, application Italy, Dec. 23, 1975, 12947/75

Int. Cl.[2] **B27B** *5/06;* **B26D** *7/06*

U.S. Cl. 83—272 **4 Claims**



1. An apparatus for feeding strips of panels to a panel cutting and sizing machine, in which the strips of panels are arranged the one adjacent to the other side by side, and the adjacent sides are parallel to the feeding direction, the said strips being fed to a cutting device which cuts the strips along a cutting line

which is arranged transversally with respect to the said feeding direction, said apparatus comprising:

a. a support table onto which the strips are positioned side by side;

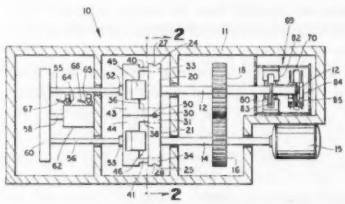
b. at least two pusher members arranged so as to push the strips towards the cutting line, each one of said pusher members being movable independently from the other in a direction towards and away from the said cutting line;

c. means for moving the said pusher members in a direction which is transversal with respect to the feeding direction and parallel to the cutting line, in such a manner to cause the selective engagement of the strips to be pushed by each one of the said pusher members.

4,065,992
SINGLE CUT SHEAR

James W. Peters, Cannelton, Ind., and Charles Hardesty, Hardinsburg, Ky., assignors to Southwire Company, Carrollton, Ga.

Filed Jan. 13, 1977, Ser. No. 758,924
Int. Cl.[2] B23D *25/12*
U.S. Cl. 83—285 10 Claims

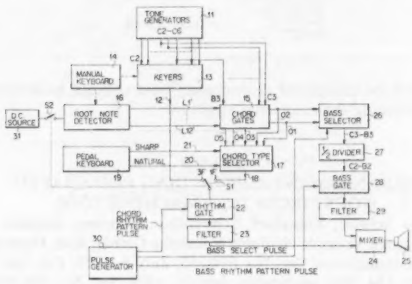


1. In a rotary shear for cutting elongate material passing through a passageway formed between two guide wheels rotating in opposite directions by selectively positioning a cutting means rotating with said guide wheels for cutting said material in said passageway and having a positioning means for moving said cutting means into a cutting position in said passageway while a first switching means is operative and for moving said cutting means from said cutting position in said passageway while a second switching means is operative, including: operating means for causing said first switching means to become operative at a first particular rotational position of said guide wheels and for selectively causing said second switching means to become operative at a second particular rotational position of said guide wheels; and conditioning means responsive to said first switching means being operative for a first predetermined rotation of said guide wheels for rendering said second switching means operative in response to said operating means at said second particular rotational position of said guide wheels, said operation of said second switching means at said second particular rotational position occurring within a second predetermined rotation of said guide wheels following the response of the conditioning means to the first switching means being operative for a first predetermined rotation of said guide wheels, wherein said first and second switching means comprise magnetically actuated vane switches, said operating means comprises a pair of vanes extending from a shaft member rotating in synchronization with said guide wheels and positioned on said shaft member so that the first of said pair of vanes passes through said first switching means and the second of said pair of vanes passes through said second switching means, and said conditioning means comprises a third magnetically actuated vane switch through which passes the first of said pair of vanes.

4,065,993
ELECTRONIC ORGAN WITH A THREE-FINGER CHORD AND ONE-FINGER AUTOMATIC CHORD PLAYING MODE SELECTOR

Yasunori Hirose, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Dec. 19, 1975, Ser. No. 642,670
Claims priority, application Japan, Dec. 26, 1974, 49-148363; Feb. 6, 1975, 50-17169; Apr. 3, 1975, 50-45185
Int. Cl.[2] G10F *1/00*
U.S. Cl. 84—1.03 23 Claims



1. An electronic organ comprising:

a manual keyboard having keys;

tone generators;

keyer means coupled to said tone generators and responsive to key actuation on said keyboard so as to selectively derive at least one tone signal from said tone generators;

automatic chord constituting means coupled to said tone generators and responsive to actuation of a key on said keyboard so as to selectively derive from said tone generators tone signals of notes constituting a chord whose root note is the note of the key being actuated, said automatic chord constituting means including:

root note detector means for detecting the root note of a chord which is played on said keyboard;

chord producing means coupled to said tone generators and to said root note detector means and responsive to said root note detector means for selectively deriving from said tone generators tone signals of notes constituting a plurality of chords having the root note; and

chord type selecting means coupled to said chord producing means for selecting tone signals from said chord producing means for constituting one type of the chords; sound producing means; and

selector switch means for selectively coupling one of said keyer means and said automatic chord constituting means to said sound producing means.

4,065,994
MUSICAL INSTRUMENT SUPPORT STAND

James L. Streit, Rte. 3, Box 364, Vernon, Tex. 76384

Continuation of Ser. No. 482,352, June 24, 1974, abandoned.
This application Mar. 22, 1976, Ser. No. 669,408
Int. Cl.[2] G10G *5/00;* A47G *29/00;* A47C *7/62*
U.S. Cl. 84—453 9 Claims

1. A stand comprising:

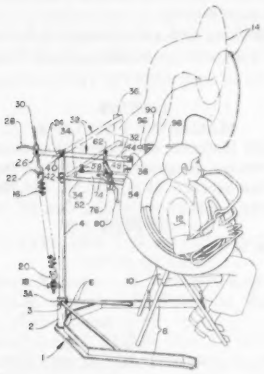
a bifurcated base having a pair of spaced-apart legs and a bight portion;

an upstanding tubular member having a lower end affixed to said bight portion, said tubular member also having an upper end and a major axis, said major axis extending from said lower end to said upper end;

an upright standard having a lower end rotatably coupled to said tubular member, said upright standard also having an upper end and a major axis, said major axis of said upright

standard lying in a substantially vertical plane coinciding with the plane in which said major axis of said tubular member lies;

a parallelogram mechanism including an upper bar and a lower bar, each of said bars having a first end, a second end and a major axis, the major axis of each of said bars extending from its first end to its second end, said parallelogram mechanism also including first means pivotally connecting said first end of said upper bar to said upright standard adjacent its upper end for rotation about a substantially horizontal axis, second means pivotally connecting said first end of said lower bar to said upright standard in the same vertical plane as, and a first predetermined distance below, said first end of said upper bar for rotation about a substantially horizontal axis and an upright bar having an upper end pivotally connected to said second end of said upper bar and a lower end pivotally connected to said second end of said lower bar, said upright bar having a major axis extending from its upper end to its lower end and being of a second predetermined length



substantially equaling said first predetermined length, whereby said upright bar will remain substantially parallel to said upright standard during pivoting movements of said first ends of said upper and lower bars;

a shaft having a major axis;

means rotatably coupling said shaft to said upright bar in a manner such that said major axis lies in a horizontal plane, said shaft being rotatable about said major axis;

means coacting with said shaft for limiting rotation thereof to a small, predetermined arc;

means affixed to said shaft for supporting a predetermined load;

means connected to said parallelogram mechanism for at least partially counterbalancing said predetermined load; and

means coacting with said upright standard for limiting the rotation thereof in a manner such that the position of said load with respect to the position of each of said legs on said base remains such that said load will not upset said base regardless of the rotated position of said standard.

4,065,995

POCKET FINGER EXERCISE BOARD

Michael M. Greer, Box 22, McGrath, Alaska 99627

Filed Oct. 8, 1976, Ser. No. 730,921
Int. Cl.[2] G09B *15/06*
U.S. Cl. 84—465 **6 Claims**

1. A pocket finger exercise board comprising:

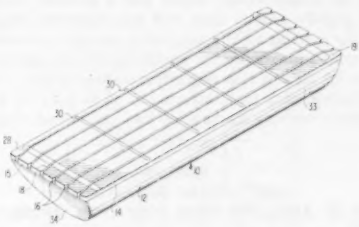
an open top elongated hollow body member having a bottom wall, end and side walls and forming coplanar edges,

a planar cover member having width and length dimensions corresponding to those of said body member and forming opposed ends and top and bottom faces,

a plurality of transversely extending, longitudinally spaced ribs on said cover member top face,

laterally spaced notches on both ends of said cover member,

at least one string, strung longitudinally about said cover member from end to end and being positioned within said notches and forming a plurality of spaced parallel string



portions extending longitudinally across the top face of said cover member and in contact with said transversely extending ribs,

means for fixing the ends of said at least one string to the bottom face of said cover member under tension, and

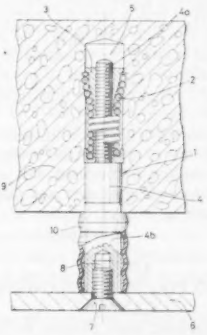
means for fixing said cover member to the open top of said body member with said string end fixing means located interiorly of said hollow body member.

4,065,996

ANCHORING DEVICE FOR USE IN MASONRY AND LIKE STRUCTURES

Artur Fischer, Altheimer Strasse 219, D-7241 Tumlingen, Germany

Continuation of Ser. No. 476,289, June 4, 1974, abandoned. This application Dec. 18, 1975, Ser. No. 641,917
Claims priority, application Germany, June 9, 1973, 2329677
Int. Cl.[2] F16B *13/06*
U.S. Cl. 85—64 **9 Claims**



1. An anchoring device for use in mounting an object at a distance from masonry and like supporting structures, comprising a supporting structure having a mounting hole and a mounting surface; a first element adapted to be received and anchored in said hole of said structure, said first element including an expansion sleeve member, and an expander member adapted to be drawn into said expansion sleeve member; an object having a surface facing said mounting surface and defining therewith a gap communicating with the ambient atmosphere; a second element having a first portion located in said hole and secured in said first element, said first portion of said second element being adapted to draw said expander member of said first element into said expansion sleeve member of the

latter, and a second portion having a part extending outwardly from said hole across said gap and adapted to carry said object at a predetermined distance from said structure; and means for preventing the access of corrosion-producing media in said gap to said elements, said preventing means including an axially resiliently yieldable circumferentially-complete protective tubular sleeve having axially spaced end faces and surrounding said part of said second portion of said second element in said gap intermediate said structure and said object, said sleeve having an uncompressed length and a partially compressed length slightly smaller than said uncompressed length, and means for exerting axial compressive pressure on said tubular sleeve until said compressed length equals said predetermined distance for thereby effecting direct sealing contact of said end faces thereof with said surfaces, so as to prevent access of corrosion-producing media from said gap to said elements.

4,065,997

SHOT SHELL RELOADING

Johnnie D. Allen, 105 Bayou Vista Drive, Hitchcock, Tex. 77563

Continuation-in-part of Ser. No. 411,091, Oct. 30, 1973, abandoned. This application June 16, 1975, Ser. No. 577,565
Int. Cl.[2] F42B *33/12*
U.S. Cl. 86—39 9 Claims

1. A single step crimping device comprised of a tubular crimping sleeve whose interior of said sleeve is comprised to guide a shot shell casing along sidewalls of said interior of said sleeve for which lips of said casing receive a series of operations of which initiate crimp to said lips of said casing,

a said sleeve whose upper interior comprises a section of which reduces the diameter of finalized crimp of said casing,

a said sleeve comprising a plurality of evenly spaced primary crimping deflectors of said upper interior of said sleeve for the purpose of initiating creases to said lips of said casing,

a said sleeve comprising of the upper interior of said sleeve a 30° angle from horizontal plane of which deflects said initiated crimp to axis,

a said sleeve comprised of a short smaller bore of which may encase the head portion of elongated compression plunger,

a said sleeve comprised of the upper exterior of said sleeve, a smaller section of which may aid to retain a heavy compression spring of which induces precise resistence to said plunger and said casing upon actuation of reloading press,

a said sleeve comprised of design to be self contained of dimensions and formations of which initiate said crimp to said lips of said casing,

a said sleeve of which receive for utilization thereof essential parts of which aid to finalize the crimp to said casing whose characteristics of material include, new plastic, new paper, used plastic, and used paper upon actuation of reloading press.

4,065,998

GUN LOCK AND FIRING MECHANISM FOR 30MM CANNON

John G. Rocha, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 30, 1976, Ser. No. 701,490
Int. Cl.[2] F41D *7/02*
U.S. Cl. 89—11 15 Claims

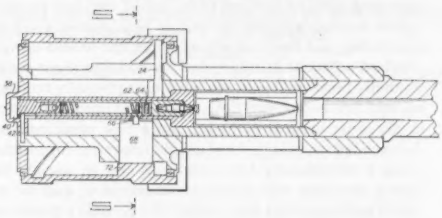
1. In a weapons system including a stationary receiver, a reciprocable firing chamber, a reciprocable bolt and a reciprocable firing mechanism having in and out of battery positions, the improvement comprising:

means for reciprocating said firing chamber between said positions,

means carried by the receiver for locking the firing chamber in the in-battery position,

means carried by the firing chamber to move the bolt between said positions and to secure the bolt in the in-battery position,

means carried by the bolt to move the firing mechanism between said positions and to secure the firing mechanism, when cocked, in the in-battery position,



means carried by the firing chamber locking mechanism for automatically initiating release of said cocked firing mechanism to fire a round when said firing chamber is in said in-battery position and,

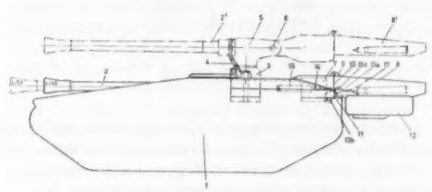
means for latching and unlatching said locking means in response to the relative position of said firing chamber.

4,065,999

MAGAZINE FOR TANK

Karl Sten Rudolf Hultgren, and Sven-Håkan Svensson, both of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden

Filed Sept. 25, 1975, Ser. No. 616,706
Claims priority, application Sweden, Oct. 18, 1974, 7413125
Int. Cl.[2] F41H *7/06*
U.S. Cl. 89—36 H 9 Claims



1. In a tank, the combination comprising:

a large-caliber pivotable firearm and means for raising and lowering the pivot of the firearm relative to the tank chassis,

a first magazine connected to the firearm at the rear end of the firearm and movable with movement of the firearm,

a second magazine connected to the tank chassis and lying exteriorly of said chassis,

and means for interconnecting said first and second magazines only when the firearm and first magazine are moved to a preselected position relative to the chassis and second magazine which brings said first and second magazines in close juxtaposition so as to permit the transfer of rounds of ammunition from said second magazine to said first magazine.

4,066,000

MACHINE GUN

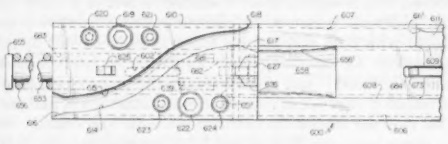
Charles Edward Rostocil, Sugar Grove, Va., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 25, 1974, Ser. No. 464,109
Int. Cl.[2] F41D *9/02, 11/06, 11/12;* F41F *17/10, 17/12*
U.S. Cl. 89—198 82 Claims

1. An automatic weapon for automatically firing live cartridges comprising:

a. a receiver housing;

b. a bolt assembly slidably mounted for fore and aft movement within the housing;
c. trigger means for releasing the bolt assembly;
d. a barrel assembly including chamber means mounted in the housing;
e. a feed system;
f. the bolt assembly being adapted to advance the feed system while ejecting spent cartridges during its aft move-



ment and to chamber live cartridges and reset the feed system, the bolt assembly comprising:

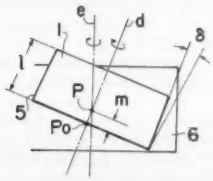
1. a body having top and bottom surfaces; and
2. a buffer assembly biasably movably mounted on the bolt assembly adapted to seat on top of the barrel of the barrel assembly when the bolt assembly is moving forward to chamber a cartridge, the buffer assembly also acting to absorb excess energy to reduce peak recoil forces.

4,066,001

SKIVING CUTTER FOR USE IN CUTTING INTERNAL SPUR GEAR

Komio Nishijima, Komatsu, and Masakazu Kojima, Kanazawa, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Continuation of Ser. No. 523,137, Nov. 12, 1974, abandoned.
This application July 21, 1976, Ser. No. 707,269
Int. Cl.[2] B26D *1/12;* **B23F** *1/00*
U.S. Cl. 90—3 **1 Claim**



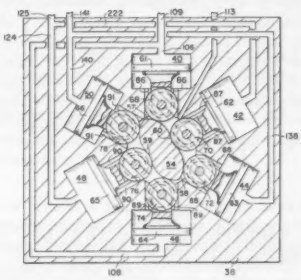
1. A skiving cutter device for use in cutting an internal spur gear, which comprises a cutter head with a main spindle, a cutter body mounted on said main spindle with cutter blades, each cutter blade formed in a gear tooth on said body such that the distal end of each of said cutting blades is located at a position offset from the pitch point between the cutter and a workpiece to be cut located on a support means proximate to said spindle, wherein the contacting point between the respective cutter blades and each gear tooth formed on said workpiece is located within a contacting or acting region defined by the encompassed among interference lines respectively described by the root and the bottom of said each gear tooth formed on the workpiece and an interference line described by the addendum of said each gear tooth-shaped cutter blade of the cutter so that a predetermined design value of the tooth profile of the cutter may be selected to be near the lower limit of said region.

4,066,002

FLUID PRESSURE OPERATED ROTARY STEPPER ACTUATOR

James M. Eastman, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed June 14, 1976, Ser. No. 695,663
Int. Cl.[2] F15B *21/02;* **F01B** *1/06*
U.S. Cl. 91—36 **11 Claims**



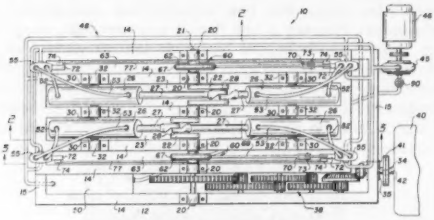
1. A rotary stepper actuator comprising:
a casing:
a shaft mounted in said casing for rotation about its axis;
cam means coaxial with and fixedly secured to said shaft for rotating the same, said cam means being generally elliptical in shape having major and minor axes perpendicular to said axis of rotation, said major axis defining radially opposite elongated portions, said cam having opposite recessed portions radially inwardly from the ends of said minor axis, said elongated portions joining said recessed portions to define a continuous surface, said surface being symmetrical about said major and minor axis;
a first source of pressurized fluid;
a second source of pressurized fluid at a relatively lower pressure compared to said first source;
force producing means contained by said casing including at least three pairs of fluid pressure responsive pistons in a radially spaced relationship about said shaft's axis of rotation, each said piston pair being axially aligned in the same radial plane through said shaft's axis of rotation in a radial force opposing relationship, with each said piston in a radially measured equal angular spaced relationship from each said adjacent piston, each said piston pair operatively engaging said cam's surface for imposing an oppositely directed force couple thereon in response to said first source of pressurized fluid;
valve means including conduit means for fluidly connecting said first and second sources of pressurized fluid with said piston pairs;
said first source of pressurized fluid initially communicated to one said piston pair which is engaged with said opposite recessed portions of said cam's surface thereby providing a positive piston lock on said cam; and
control means operatively connected to said valve means for actuating the same to selectively communicate said first source of pressurized fluid to one of said piston pairs adjacent said piston pair that is providing said positive position lock and said second source of pressurized fluid to the remaining piston pairs thereby rotating said cam a predetermined angular increment until said selected piston pair receiving said first source of pressurized fluid engages said recessed portion of said cam's surface to create another said positive position lock.

4,066,003

HYDRAULIC ENGINE

Murray William Alde, Sr., Box 38, Saltery Bay, R.R. No. 3, Powell River, B.C., Canada (V8A 5C1)

Filed Dec. 27, 1976, Ser. No. 754,489
Int. Cl.[2] F01B 1/00
U.S. Cl. 91—170 R 4 Claims



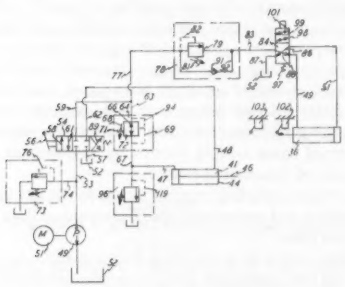
1. A hydraulic engine comprising a frame, a crankshaft journalled on the frame, hydraulic cylinders arranged on the frame as horizontally opposed and side-by-side pairs, a piston rod for each cylinder operatively connected to the crankshaft, trunnion means individually securing each cylinder to the frame whereby adjacent cylinders of each pair of cylinders are rockable about a common axis extending parallel to the crankshaft, a power take-off shaft journalled on the frame, a drive train operatively connecting the crankshaft to the power take-off shaft, a fluid circuit connecting the hydraulic cylinders to a source of pressurized fluid and including a distribution valve for each of said cylinders, and motion transmitting means connecting the crankshaft to the distribution valves whereby opposite ends of the hydraulic cylinders are pressurized sequentially to extend and retract the piston rods and rotate said crankshaft.

4,066,004

OSCILLATORY ELECTRO-HYDRAULIC SYSTEM

Joseph Alcalay, Kenosha, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed July 6, 1976, Ser. No. 702,479
Int. Cl.[2] F01B 15/00; F01L 25/08; F15B 13/06
U.S. Cl. 91—183 13 Claims



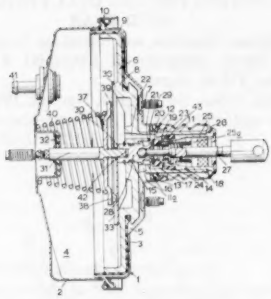
1. An oscillatory electro-hydraulic system for a material handling bucket, comprising two hydraulic cylinder assemblies connected with said bucket to be mechanically connected relative to each other for pivoting said bucket, said cylinder assemblies being the double acting type and each including a cylinder portion and a rod extendable from the cylinder portion of each of said assemblies, a hydraulic pump hydraulically connected in separate respective connections to the head and rod ends of a first one of said cylinder assemblies, a hydraulic line hydraulically connected between said cylinder assemblies, a hydraulic control valve connected with said hydraulic line and having two pairs of hydraulic passageways with each pair thereof having one of said passageways separately selectively hydraulically connectable to one of the head and rod ends of the second one of said cylinder assemblies, for controlling hydraulic flow to the respective head and rod ends of said second one of said cylinder assemblies, and the other of said passageways in each of said pairs being a hydraulic return passageway, all for permitting hydraulic pressurizing and actuation of said first one of said cylinder assemblies while said second one of said cylinder assemblies is free to actuate without hydraulic pressure, an electric system operatively associated with both said control valve and one of said cylinder assemblies for operating said control valve, electric switch means included in said electric system and being arranged to be actuated in response to extension and contraction of said one of said cylinder assemblies to thereby actuate said control valve to direct hydraulic flow to and from the head and rod ends of said second cylinder assembly, and a second switch included in said electric system and being arranged to be actuated in response to extension and contraction of said one of said cylinder assemblies for electrically opening said electric system and leaving said control valve in an operative position where only one of said head and rod ends of said second cylinder assembly is hydraulically pressurized.

4,066,005

SERVO-MOTORS FOR VEHICLE BRAKING SYSTEMS

Glyn Phillip Reginald Farr, Kenilworth, England, assignor to Girling Limited, Birmingham, England

Filed July 21, 1975, Ser. No. 597,909
Int. Cl.[2] F15B 9/10; F01B 19/00; F16J 3/02
U.S. Cl. 91—369 B 1 Claim



1. A fluid-pressure operated servo-motor comprising a housing an input member, an output member, a movable wall dividing said housing into separate chambers and through which said input member acts on said output member, valve means responsive to an input force applied to said input member for controlling the generation of differential pressure to opposite sides of said movable wall to produce an output force which is adapted to be transmitted to said output member through said wall, and reaction means for transmitting back to said input member a reactive proportion of said output force to provide a reaction whereby operation of the servo-motor can be more readily controlled, wherein said reaction means comprises a single component in the form of a one-piece annular reaction plate of corrugated outline which, in use, is adapted to flex to transmit a load from said movable wall to said output member and to transmit a reactive proportion of said output force back to said input member, wherein said annular reaction plate comprises angularly spaced fingers of segmental outline having inner and outer ends of which alternate fingers are located in a corresponding one of two spaced parallel planes, and radial webs substantially normal to said fingers and extending between said planes integrally interconnect adjacent fingers and said movable wall includes an axially movable piston of sub-

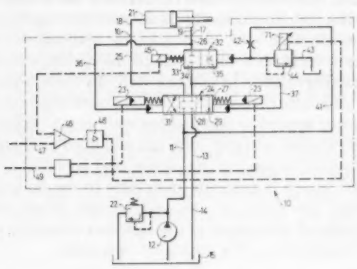
stantial diameter, and a face of said piston adjacent to said output member is provided with abutment means which defines a fulcrum for said outer end of said fingers and said output member is provided with abutment means defining a fulcrum with said plate at an intermediate point in the radial length of said plate, and wherein said piston comprises a hub member guided in said housing for sliding movement and having an inner end, a radial flange at said inner end of said hub member provided with a recess, and a first metal pressing retained in said recess accommodates said annular reaction plate, and a second metal pressing clamped against said hub member by said first metal pressing to retain in a groove in said hub member, a tickening or bead at the peripherally innermost end of a flexible diaphragm which is supported by said second pressing and which is sealingly connected to said housing at its outermost peripheral edge, and projection means provided in said first pressing defining said abutment means.

4,066,006

FLOW REGULATING SYSTEM

Joachim Heiser, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Dec. 17, 1975, Ser. No. 641,701
Claims priority, application Germany, Dec. 21, 1974, 2461021
Int. Cl.[2] F15B *13/043*
U.S. Cl. 91—433 **15 Claims**



1. In combination with a pressure-responsive actuator having a pair of connections pressurizable for operating said actuator, a hydraulic system comprising:

first and second load supply lines each connectable to a respective one of said connections;

a source of fluid under pressure having a high-pressure side and a low-pressure side;

a main control valve connected between said load supply lines and said source and having a movable control member displaceable between a first end position connecting said first line to said high-pressure side and said second line to said low-pressure side, a second end position connecting said second line to said high-pressure side and said first line to said low-pressure side, and an intermediate central position blocking fluid flow between said high-pressure and low-pressure sides and said supply lines, said control valve having means including a pair of oppositely effective springs bearing on said member for urging said member into said central position;

means responsive to a direction signal and including a pilot valve connected to said member of said main control valve for displacing same into one of said end positions in dependence upon said direction signal;

a restriction in one of said load supply lines and forming a variable flow passage displaceable between a relatively wide position and a relatively narrow position, whereby the pressure differential across said restriction is greater in said narrow position than in said wide position;

pressure-responsive means connected to said one load supply line to both sides of said restriction and connected to said main control valve for applying the pressure differential across said restriction to said main control valve in said first position thereof in a direction urging said main control valve into said second position and in said second position thereof in an opposite direction urging said main control valve into said first position, said pressure-responsive means including a pair of pistons bearing each in a respective direction through a respective spring on said member and each having an inner face turned toward said member and engaging the respective spring and an outer face turned away from said member, a pair of inner chambers each between a respective inner face and said member, and a pressure line between each of said inner chambers and a respective side of said restriction; and

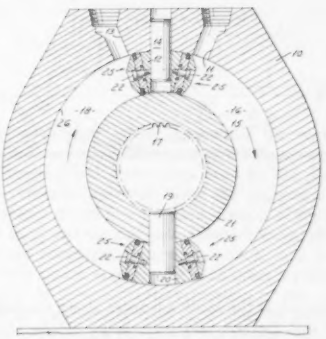
electrical actuating means connected to said restriction for generating an input signal and displacing said restriction between said wide and narrow positions therewith, said direction signal responsive means including a pair of outer chambers each at a respective outer piston face and a pressure line between each of said outer chambers and a respective portion of said pilot valve.

4,066,007

ACTUATOR SEAL ASSEMBLY

Roland J. Barlow, Madison Heights, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed July 8, 1976, Ser. No. 703,480
Int. Cl.[2] F01C *9/00*; F16J *1/00*
U.S. Cl. 92—125 **6 Claims**



1. In a rotary actuator device consisting of a housing with internal arcuate surfaces, cover plates affixed to said housing, an actuator stop means and an actuator shaft and vane means having a seal means comprising a seal carrier means shaped to closely fit between said cover plates and between said actuator shaft and arcuate surface of said housing;

a first O-ring and glide ring located in a channel on said seal carrier means with a seal retainer fixedly held on one side of said carrier means

a second O-ring captively retained in a counterbore in said seal carrier means on a remaining opposite side of said carrier means; and

a holding means affixing said seal means to one side of said actuator vane said actuator stop means also including a seal means.

4,066,008

CARTON FORMING MACHINE

George B. Arvanigian, 6846 Hickory Point Drive, Portage, Mich. 49002

Filed Sept. 13, 1976, Ser. No. 722,612
Int. Cl.[2] B31B *3/26*
U.S. Cl. 93—49 R **12 Claims**

1. In an apparatus for forming a knock-down preglued box from a preformed blank having a center panel, a pair of opposed foldable side flaps, a pair of opposed foldable end flaps,

and opposed pairs of front and rear foldable corner tabs which are connected to and project sidewardly from the opposite edges of the end flaps, the improvement comprising:

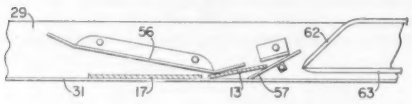
frame means;

elongated guide means mounted on said frame means and defining an elongated path along which said blank is moved, said guide means including a pair of substantially parallel guide members which are transversely spaced apart for slidably guiding the opposite edges of the blank therebetween;

drive means extending longitudinally of said path for moving said blank therealong;

first folding means disposed adjacent the inlet end of said path for automatically folding the front corner tabs upwardly so as to partially overlap the center panel as the blank is moved along said path by said drive means, said first folding means being nonpowered and comprising a pair of identical folding devices which are positioned adjacent the opposite sides of said path in the vicinity of said guide members;

each said folding device including a tab lifting lever supported for pivotal movement about a substantially horizontal axis, said tab lifting lever being normally urged by gravity into a lower position wherein the lever extends upwardly at an acute angle relative to the direction of movement of the blank so that the upstream end of the lever projects into the path of movement of the front



corner tab as the blank advances along the path from the inlet end thereof, said lever being hinged about an axis positioned above said path so that said front corner tab engages said lever when in said lower position and swingably displaces the upstream end thereof into an upper position which results in said front corner tab being lifted upwardly above the remainder of the blank while permitting the trailing side flap to freely pass beneath the lever;

each said folding device also including a stationary reaction member positioned directly above and slightly spaced from said lifting lever for confining the front corner tab therebetween;

each said folding device further including a stationarily positioned folding element disposed directly downstream of said lever for engaging the front corner tab after it has been lifted by said lever and folding same over so as to at least partially overlap said central panel;

hold-down means disposed directly downstream of said folding element for engaging and holding the front corner tab in its folded-over position;

adhesive applying means positioned downstream of said first folding means for applying adhesive to one of said side flaps or said folded corner tabs; and

second folding means positioned downstream of said first folding means and coacting with the opposed side flaps for folding the side flaps upwardly and inwardly so as to overlap said central panel and the previously folded corner tabs.

4,066,009

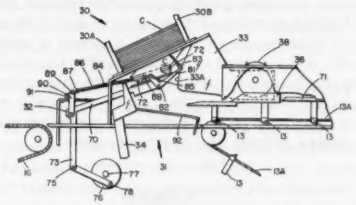
METHOD FOR OPENING AND ERECTING CARTONS

Rodney K. Calvert, Dunwoody, and Charles Rabun Landrum, Doraville, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 568,243, April 15, 1975, Pat. No. 3,991,660. This application Sept. 20, 1976, Ser. No. 724,704

Int. Cl.[2] B31B *5/26*

U.S. Cl. 93—53 M **3 Claims**



1. A method of withdrawing from a hopper and setting up a collapsed open ended carton having a glue joint formed in one wall and having at least one hand gripping aperture formed in said one wall adjacent said glue joint and generally midway between the ends thereof, the method comprising the steps of applying a force to another wall of the carton which is in the general direction in which the carton is to be withdrawn from the hopper, substantially simultaneously projecting finger means through said hand gripping aperture to engage and apply a force to a third wall of the carton which is in face contacting relation to said one wall, the force being in a direction generally perpendicular to said third wall and opposite to the force applied to said another wall so as to rupture any glue bond between said glue joint and said third wall and to prevent downward bowing of the carton, and applying a force to the carton which is generally transverse to the direction of withdrawal movement of the carton only after predetermined withdrawal movement of the carton is effected so as to facilitate continuation of a setting-up operation.

4,066,010

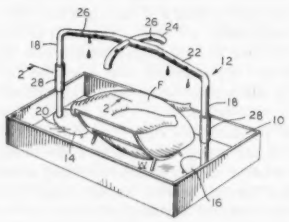
AUTOMATIC BASTER

Kim Larsson, 825 W. 71st Ave., Apt. No. 204, Vancouver, British Columbia, Canada

Filed Jan. 27, 1977, Ser. No. 762,886

Int. Cl.[2] A47J *27/52, 37/10*

U.S. Cl. 99—346 **5 Claims**



1. An automatic baster comprising:

an inverted substantially U-shaped standard adapted to be placed in a roasting pan partially filled with water, said standard including

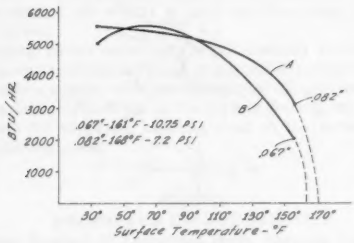
a pair of tubular legs connected by a tubular bight portion, said bight portion including a plurality of holes to allow the passage of liquid therethrough, and

means connected to said legs for raising and lowering said legs relative to said pan.

4,066,011
APPARATUS FOR THAWING FROZEN FOOD

Earle W. Ballentine, 3641 Via Palomino, Palos Verdes Estates, Calif. 90275

Continuation-in-part of Ser. No. 179,721, Sept. 13, 1971, abandoned, which is a continuation-in-part of Ser. No. 553,065, May 26, 1966, Pat. No. 3,604,334. This application Sept. 18, 1972, Ser. No. 290,122
Int. Cl.[2] A01J *11/04*
U.S. Cl. 99—467 10 Claims

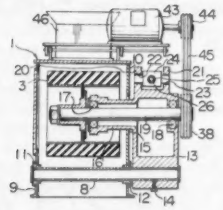


1. Apparatus for reconstituting frozen food comprising:
a convective source of hot burner gases;
chamber means for supporting frozen foods;
guidance means positioned in the walls of the chamber means for directing the flow of the hot burner gases over the frozen food supported in the chamber means;
boiler means for adiabatically transforming a large portion of the sensible heat in the hot burner gases into the latent heat of steam;
means for homogeneously intermixing external to the chamber means, the steam with air and the hot burner gases which have lost a portion of their sensible heat; and
means for forcing the homogeneous mixture to flow turbulently with said guidance means towards the top and bottom surfaces of the frozen food supported in the chamber means.

4,066,012
ROLL TYPE HULLER

Toshihiko Satake; Akira Kono, and Hiromichi Yanagihara, all of Higashihiroshima, Japan, assignors to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1976, Ser. No. 667,166
Claims priority, application Japan, June 2, 1975, 50-66877
Int. Cl.[2] B02B *3/04*
U.S. Cl. 99—618 5 Claims

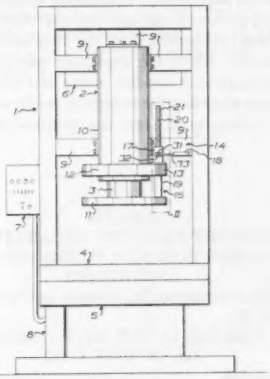


1. A roll type huller for removing grain hulls comprising a housing; a pair of rolls spaced apart in parallel within the housing; a main shaft carrying one of the rolls at one end portion thereof and supported by the housing rotatably about a fixed axis; a counter shaft carrying the other roll at one end portion thereof; pivot means spaced from and parallel to the fixed axis, the pivot means having an arm extending therefrom for supporting the counter shaft, the pivot means being supported by the housing in a relative location directly confronting the roll-carrying portion of the counter shaft whereby the counter shaft can move toward and away from the main shaft while in parallel therewith.

4,066,013
MECHANICAL SAFETY DEVICE FOR THE PLUNGER IN PRESSES OF THE DOWN-STROKE OR ECCENTRIC TYPE

Klas Axel Lennart Skoglund, and Stig Gunnar Bengt Backgard, both of Lagan, Sweden, assignors to Lagan Press AB, Lagan, Sweden

Filed July 29, 1976, Ser. No. 709,789
Int. Cl.[2] B30B *15/00*
U.S. Cl. 100—53 10 Claims

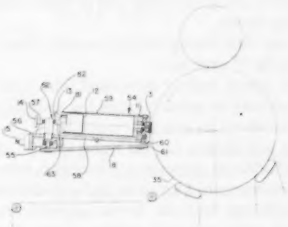


1. In a mechanical safety device for the reciprocating plunger in downwardly acting presses, the improvement comprising a stopping rod immovably fixed on the plunger and extending vertically upwardly from the plunger, a stopping sleeve rotatably mounted on a fixed portion of the press and positioned such that the rod passes therethrough, the rod and sleeve having cooperating members which, in a first rotary position of the sleeve, engage with each other for stopping the plunger, and, in a second rotary position of the sleeve, are moved out of engagement with each other to permit movement of the rod through the sleeve and thereby movement of the plunger, and means for rotating the sleeve.

4,066,014
PRESSURIZED INK APPLICATOR FOR INTAGLIO PRINTING PRESS

Peter van Haaften, Ottawa, Canada, assignor to American Bank Note Company, New York, N.Y.

Continuation-in-part of Ser. No. 479,898, June 17, 1974, abandoned. This application Jan. 5, 1976, Ser. No. 646,493
Int. Cl.[2] B41F *9/10, 31/08*
U.S. Cl. 101—157 21 Claims



1. A stiff bodied ink applicator for an intaglio security print-

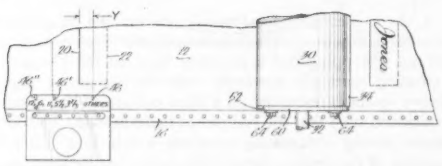
ing press having a printing surface having a plurality of engraved recesses defining an image, comprising: a nozzle for applying ink to the engraved recesses of the printing surface and for doctoring applied ink from the non-engraved areas of the printing surface, means for removably mounting the nozzle in contact with the printing surface, conduit means connecting the nozzle to a source of ink under pressure, said nozzle including at least two transversely extending blades and means biasing an edge of each said blade towards the printing surface whereby the nozzle sealingly contacts the printing surface, one of said blades defining the trailing edge of said nozzle for doctoring applied ink from the nonengraved areas of the printing surface, energy transfer means associated with said conduit means for imparting energy to the ink whereby the flow characteristics of the ink are improved before application of the ink to the printing surface, a cam moving with the printing surface, follower means cooperating with the cam, and a sliding valve slidably mounted within the applicator transverse to the ink flow path through said conduit means and controlled by the follower means and effective to impede the flow of ink through the conduit means in at least one position of the follower means.

4,066,015

STATIONERY PRINTING APPARATUS FOR CONTINUOUS BUSINESS FORMS STATIONERY ASSEMBLIES

Peter R. Polko, Barrington, Ill., assignor to Uarco Incorporated, Barrington, Ill.

Filed July 11, 1975, Ser. No. 595,074
Int. Cl.[2] B41F *13/02*
U.S. Cl. 101—228 **9 Claims**



4. Stationery printing apparatus for printing indicia at a predetermined position on each form length of continuous business forms stationery assemblies formed of an elongated series of interconnected individual business forms, each of equal length, said apparatus comprising:

a rotary printing roll having at least one printing surface thereon;

impression means associated with said roll to define a printing nip so that a continuous business forms assembly passing through said nip will be imprinted upon by said printing surface at said nip,

means for moving a continuous business forms assembly along a path of stationery travel extending through said nip including a drive mechanism forwardly of said nip,

means for rotating said print roll in timed relation with said moving means,

at least one first lineup indicia located along said path and forwardly of said nip,

a second lineup indicia associated with said roll whereby said roll may be initially located at specific predetermined location about its axis of rotation,

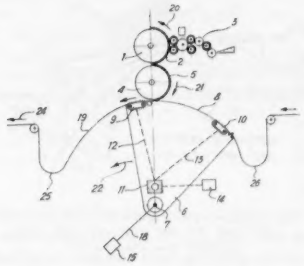
said first and second indicia being located along said path and on said roll, respectively, such that when said roll is in said predetermined location, and a predetermined point on a continuous business forms assembly in said path is aligned with said first indicia, upon operation of said moving means, the form lengths will be imprinted upon at said predetermined position thereon.

4,066,016

PRINTER WITH INTERMITTANT VARIABLE WEB FEED

Eric Tison, Ponthierry, France, assignor to Ateliers de Constructions Mecaniques Seailles & Tison, Paris, France

Continuation of Ser. No. 542,547, Jan. 20, 1975, abandoned. This application Sept. 2, 1976, Ser. No. 719,709
Claims priority, application France, Jan. 22, 1974, 74.02027
Int. Cl.[2] B41F *13/04*
U.S. Cl. 101—228 **8 Claims**



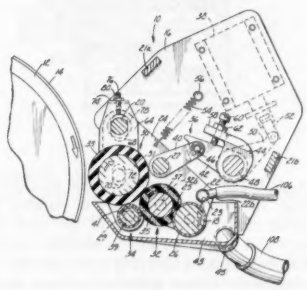
1. A printing device for printing spaced indicia on a moving band of material including means for defining printing and non-printing phases of machine operation comprising at least one rotatable printing element for printing indicia on the band, at least one counter pressure printing platen pivotally mounted about an axis for cooperating with said at least one printing element during the printing phase and having a curved surface for supporting the band, motor means for reciprocatingly pivoting said pivotally mounted platen, traction means mounted on said platen for engaging the band to move said band intermittently over the surface of said platen during the non-printing phase, a pulse generator for generating varying numbers of pulses in accordance with a program, a step by step motor operable by the pulses of said generator for actuating said traction means for moving varying lengths of the band over the surface of the platen during the non-printing phase in accordance with the number of pulses generated by the generator in accordance with the program.

4,066,017

BLANKET CLEANER FOR DUPLICATING MACHINES

Ronald J. Garcowski, Parma Heights, and William A. Davis, Wickliffe, both of Ohio, assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 594,208, July 9, 1975, abandoned. This application Sept. 27, 1976, Ser. No. 726,941
Int. Cl.[2] B41F *35/06*
U.S. Cl. 101—425 **16 Claims**



1. A printing machine, comprising:

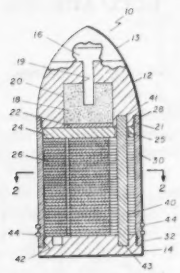
a rotary blanket cylinder driven at a predetermined surface speed;
a frame movably mounted on the printing machine adjacent the cylinder;
a cleaning roller rotatably supported by the frame in a position for forming a first nip with the cylinder to perform a cleaning operation;
a wiper roller having an open-cell sponge cover rotatably supported by the frame in contact with the cleaning roller and forming a second nip therewith;
means for continuously rotating both of said cleaning and wiper rollers at speeds such that the difference in surface speeds of the rollers at each nip is at least about 200 cm/sec;
cleaning means comprising a continuously rotating roller having a substantially non-compressible surface in rubbing surface contact with the wiper roller for preventing accumulation of deposits on the surface thereof; and
means for supplying cleaning fluid to the surface of the cleaning roller.

4,066,018

PROPELLER DISK PROJECTILE

Vladimir Ignatjev, 39 Ledgewood Drive, Norwalk, Conn. 06850

Filed Jan. 13, 1977, Ser. No. 759,230
Int. Cl.[2] F42B *13/48*
U.S. Cl. 102—67 **3 Claims**



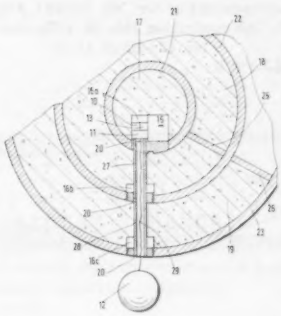
1. A spin-fired projectile for use against enemy aircraft which comprises:
an ogival shaped member having a pointed forward end, a threaded rear end boss, an axially positioned propellant charge counterbore located in said threaded rear end boss, and a plurality of rod holes disposed in said threaded rear end boss;
a propellant charge operatively positioned in said propellant charge counterbore;
a time fuze disposed in said forward end of said ogivally shaped member, said time fuze communicating with said propellant charge;
a propellant charge sealing disk member located in said propellant charge counterbore for retaining said propellant charge in said propellant charge counterbore during assembly of said projectile;
a cylindrically shaped tubular body member having an internally upper end threaedly connected to said threaded rear end boss of said ogival member and an internally threaded lower end;
a piston member having a plurality of piston rod holes therein slidably positioned in said tubular body member adjacent said ogival member rear end boss, said piston member being movably responsive to gases generated by said propellant charge;
propeller disk fragment means, transversely slidably disposed and stacked within said tubular body member for presenting a momentarily standing, ascending or descending fragment cloud effective against said enemy aircraft when being ejected from said tubular body member;
a threaded rear end member threadedly affixed to said lower end of said tubular body member having an annular groove therein, said threaded rear end member retaining said propeller disk fragment means within said spin-fired projectile during transportation to a target, said threaded rear end member separating by shear from said lower end of said tubular body member when said time fuze initiates said propellant charge, forcing said piston member in a rearward direction and said propeller disk fragment means against said rear end member.

4,066,019

ELECTRONIC HAND GRENADE

Walter Mehnert, Ottobrunn, Germany, assignor to TECHNICO Development and Financing S.A., Fribourg, Switzerland

Filed Aug. 2, 1976, Ser. No. 710,678
Claims priority, application Germany, Aug. 13, 1975, 2536123
Int. Cl.[2] F42C *11/06*; F42B *27/00*
U.S. Cl. 102—70.2 R **21 Claims**



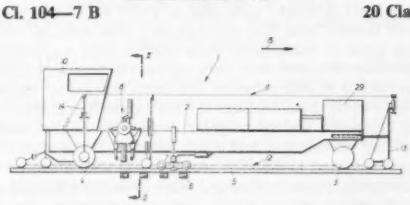
1. An electronic hand grenade with a plurality of explosive elements connected with each other, comprising
a plurality of explosive elements containing individual explosive charges, respectively,
at least one signal transmitter means for providing signals of statistically occurring criteria,
a control-processing- and storage-electronic means operatively connecting said explosive elements for feeding and transforming, respectively, and processing predetermined of said signals of statistically occurring criteria for triggering an ignition impulse for each of said individual explosive charges, respectively.

4,066,020

MOBILE TRACK TAMPING AND TRACK POSITION CORRECTION MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed June 14, 1976, Ser. No. 695,734
Claims priority, application Austria, Feb. 20, 1976, 1237/76
Int. Cl.[2] E01B *27/17*
U.S. Cl. 104—7 B **20 Claims**



1. A mobile track tamping and track position correction

machine which comprises a machine frame, undercarriages mounting the machine frame for mobility on a track consisting of a multiplicity of ties fastened to two rails, a tamping head mounted on the machine frame, the tamping head including a tamping tool carrier vertically movably mounted on the machine frame and supporting tamping tools capable of tamping ballast under respective ones of the ties upon downward movement of the tamping tool carrier and immersion of the tamping tools in the ballast adjacent the respective ties, and drive means for vibrating and reciprocating the tamping tools in the direction of track elongation, and track position correction means mounted on the machine frame, wherein the machine frame consists of an elongated carrier beam centered between the two rails and the tamping head is mounted on the carrier beam laterally thereof and astride a respective one of the rails.

4,066,021

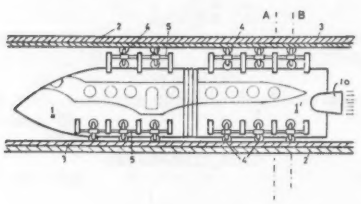
HIGH SPEED TRANSPORTATION SYSTEM

Axel-Günther Helm, Heubergstrasse 3, D-8201 Neubeuern, Germany

Continuation-in-part of Ser. No. 326,407, Aug. 20, 1973, abandoned. This application July 20, 1976, Ser. No. 707,007

Int. Cl.[2] B61B *13/10*

U.S. Cl. 104—138 R **7 Claims**



1. A transportation system comprising:

a vehicle body;

a plurality of shafts disposed around said vehicle body and supported thereby axially parallel to the direction of travel of said vehicle body;

a plurality of tracks disposed around said vehicle body, a concave surface of each track being coaxial with an adjacent said shaft and including a plurality of helically curved ribs forming the running surface thereof;

carriage means axially mounted on each of said shafts for rotation thereon; and

a plurality of wheels rotatably mounted on each said carriage means having their axes of rotation in a single plane perpendicular to the axes of said shafts for successive engagement with and disengagement from said running surface of an adjacent said track.

4,066,022

SHELF STRUCTURE AND METHOD OF MAKING SAME

Arthur H. Graves, R.R. #1, Kingston, Ontario, Canada

Filed Apr. 29, 1976, Ser. No. 681,409

Claims priority, application Canada, July 17, 1975, 231673

Int. Cl.[2] A47B *85/00*

U.S. Cl. 108—14 **3 Claims**

1. A shelf structure including a frame and a plurality of shelves therein, said frame comprising four vertical tubular corner posts of rectangular cross section with a plurality of horizontally disposed, vertically spaced rail members defining the perimeter of said structure and being welded to said posts to interconnect them together to form a rigid frame; said frame being elongated and rectangular in form having at least an open front portion and end portions; said rail members each being of inverted U-shape in cross section with a cap portion and integrally formed outer and inner depending flanges, portions of said cap being cut away to allow positioning therein of the corner posts and whereby the outer flange of the rail is wrapped around the exterior of said post; tubular end closure members, parallel with the corner posts, in the ends of the structure and extending upwardly through the cap of each rail and being secured to at least one thereof, the inner flange of

each rail having inwardly extending lower and upper ribs; and a shelf positioned within the confines of each rail member with edges of the shelf being held against vertical movement relative to each rail member by said upper and lower ribs.

4,066,023

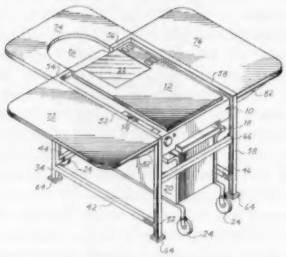
COPY MACHINE TABLE

Kingdon R. Hughes, P.O. Box 2424, Midland, Tex. 79701

Filed Jan. 24, 1977, Ser. No. 761,805

Int. Cl.[2] A47B *37/00*

U.S. Cl. 108—50 **13 Claims**



1. A table adapted for use with a copy machine, said copy machine having

a. a rectangular top surface,

b. a transparent platen on said top surface,

c. an ejection slot for ejecting copies in a side below said top surface,

d. a paper input slot for injecting paper in a side below said top surface,

e. an access door in a side below said top surface, and

f. a base supporting said copy machine on the floor;

the improved table comprising in combination with the above:

g. a framework on said floor,

h. at least two planar leaves,

j. said copy machine within said framework,

k. leaf hinges attached to each planar leaf,

m. said leaf hinges securing each of said planar leaves to the framework in a horizontal position with at least one side of each of said planar leaves adjacent to at least one side of the copy machine within said framework, and

n. said leaf hinges also securing each of said planar leaves to the framework in a horizontal position with the upper surfaces of said planar leaves coplanar with the transparent platen of said copy machine as defined above,

o. said leaf hinges further forming means for securing said planar leaves to the framework so that leaves may be folded to a vertical position proximate

said framework,

p. Said framework having four legs,

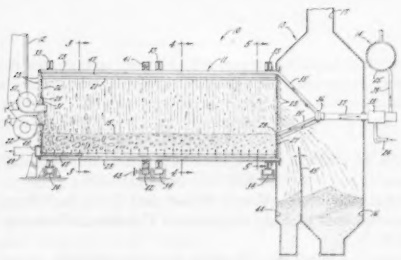
q. said legs rigidly connect together on three sides of said copy machine,
r. said framework having at least two top braces connected to the top of said legs,
s. said leaves being connected to said top braces by said hinges,
t. said framework having a middle brace connecting two legs below the tops thereof,
u. said middle brace being below said rejection slot.

4,066,024

ROTATING FLUIDIZED BED COMBUSTOR

Chadwell O'Connor, 2024 Galaxy Drive, Newport Beach, Calif. 92660

Filed Dec. 24, 1975, Ser. No. 644,127
Int. Cl.[2] F23G *5/06;* F23D *19/02*
U.S. Cl. 110—8 F 7 Claims



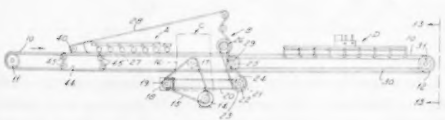
1. A rotary fluidized bed combustor comprising, in combination, a cylindrical drum mounted for rotation about its axis with said axis being substantially horizontal, said drum having annular end plates defining inlet and outlet openings, a charge of sand in said drum defining a bed extending between said openings, said bed separating the interior of said drum into a combustion region above the bed and a pyrolysis region defined by the bed, means for slowly rotating said drum so as to tumble and thus fluidize said sand, means for igniting waste material and the gas generated by pyrolysis of said waste material fed through said inlet opening and into said fluidized sand bed, and means for receiving ash and stack gas from said outlet opening.

4,066,025

HEM FOLDING MACHINE

Billy Logan Speer, P.O. Box 416, Campbellsville, Ky. 42718

Filed Aug. 4, 1975, Ser. No. 601,251
Int. Cl.[2] D05B *33/02, 35/02*
U.S. Cl. 112—121.29 22 Claims



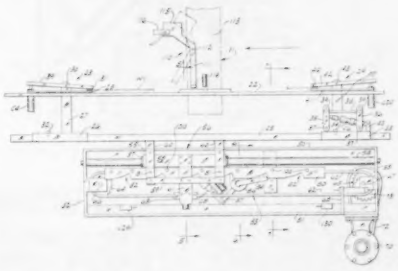
1. A hemming machine comprising conveyor means to continuously convey successive pieces of cloth, progressive folding, tucking and sewing means adjacent said conveyor means adapted to fold and tuck within the fold an edge of each cloth piece preparatory to sewing, said folding and tucking means including spaced guide rails for maintaining a spaced relation between adjacent layers of the hem material and supplemental tapered guide means extending between said spaced guide means for engaging, folding back and tucking the cloth edge between said adjacent layers, and hem engaging conveying means supplemental to and synchronized for movement with the first mentioned conveyor for continuously drivingly engaging opposite outside surfaces of the hem portion of said cloth pieces during passage through said progressive folding, tucking and sewing means, said hem engaging conveying means including means adjacent the outside surface of each of said guide rails and cooperating with said surface to feed each of said outside hem portion surfaces therebetween.

4,066,026

WORK TRANSPORT APPARATUS FOR USE WITH A BUTTON ATTACHMENT MACHINE

Morris Dean Hunt, P.O. Box 315, Dickey Woods, Adamsville, Tenn. 38310

Filed Feb. 20, 1976, Ser. No. 659,891
Int. Cl.[2] D05C *9/04*
U.S. Cl. 112—121.15 17 Claims



7. A work transport apparatus for use with a fastener applicator unit for attaching fastener elements to a garment workpiece, said transport apparatus comprising:
a. support means,
b. carriage means mounted to the support means for linear movement relative to the applicator unit,
c. workpiece holding means mounted for movement with the carriage means including:
1. a first workpiece holder having means for gripping a portion of the workpiece,
2. a second workpiece holder disposed in spaced relation from the first workpiece holder and having means for gripping another portion of the workpiece;
3. means for moving one of said holders linearly relative to the other of said holders to apply tension to the workpiece,
d. each of said holders includes pneumatically actuated jaw members, and
e. one of said holders includes pneumatically actuated relatively movable portions providing the means for moving said holders relative to each other.

4,066,027

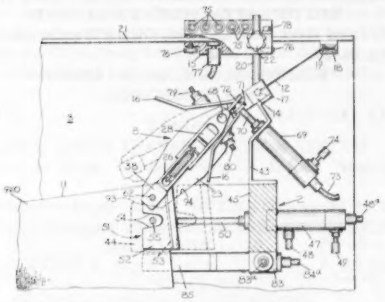
WORKPIECE FEEDER DEVICE FOR THE TRAVELING GRIPPER OF A SEWING UNIT

Nerino Marforio, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed Apr. 30, 1976, Ser. No. 681,914
Claims priority, application Italy, May 14, 1975, 23309/75
Int. Cl.[2] D05B *21/00*
U.S. Cl. 112—121.15 10 Claims

1. A workpiece feeder device for a traveling gripper movable while holding and tensioning a workpiece being advanced along the work surface of a sewing unit by the feeding elements of a sewing machine mounted adjacent one end thereof, said workpiece feeder device comprising:
a. a support member mounted on the sewing unit adjacent that end opposite the end supporting the sewing machine;
b. means defining a positioning element carried by said support member for receiving and locating the traveling gripper at the completion of each sewing cycle;

c. a workpiece positioning means carried by said support member in a position immediately adjacent to said positioning element for locating the trailing end of a workpiece in readiness for the next sewing cycle;
d. means operatively associated with said workpiece positioning means for clamping the workpiece located thereby;
e. means connected to said support member and operatively connected to said workpiece positioning means for moving the latter to a position spaced from said workpiece being held by said clamping means;
f. displacing means carried on said support member and operatively connected to said positioning element for pivoting the traveling gripper located therein to a position for engaging the workpiece; and
g. closing means mounted on said support member for engaging the traveling gripper and closing the same to effect gripping of the workpiece held by said clamping means prior to the start of the sewing cycle.

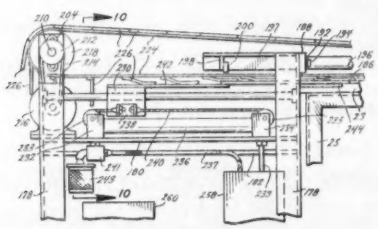


4,066,028

GUIDING, STITCHING AND DELIVERING SYSTEM

Owen T. Hornkohl, Webster Groves, Mo., assignor to Angelica Corporation, St. Louis, Mo.

Division of Ser. No. 458,570, April 8, 1974, Pat. No. 3,986,467. This application May 10, 1976, Ser. No. 684,660
Int. Cl.[2] D05B *33/00*
U.S. Cl. 112—121.29 **7 Claims**



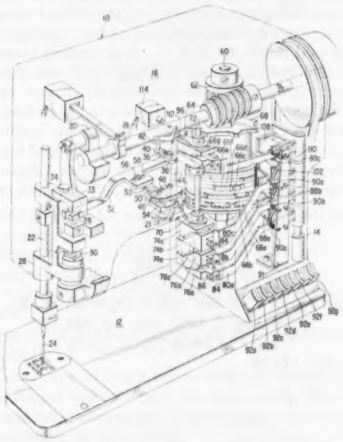
1. A material-handling system wherein objects are moved toward a stacking area by pulling forces which are applied to said objects by a delivering means, wherein a movable platform overlies said stacking area and can receive at least a part of the leading edge of an object being pulled toward said stacking area by said pulling forces applied by said delivering means, wherein a moving means can move said movable platform out of register with said stacking area and thereby permit said object, which is being pulled toward said movable platform by said pulling forces applied by said delivering means, to fall downwardly into said stacking area, wherein sensing means senses the movement of a selected edge of said object being pulled toward said stacking area by said pulling forces applied by said delivering means and actuates said moving means means to cause said movable platform to move out of register with said stacking means and thereby permit said object to fall downwardly into said stacking area, wherein said delivering means overlies at least a part of the upper surface of said movable platform so said delivering means can pull said part of said leading edge of said object onto said upper surface of said platform, and wherein said pulling forces applied by said delivering means continue to pull said object toward said stacking area after said sensing means has sensed movement of said selected edge of said object toward said stacking area and has actuated said moving means to cause said movable platform to start moving out of register with said stacking means, whereby said object continues to receive said pulling forces from said delivering means and thereby continues to move toward said stacking area until it falls away from and out of engagement with said delivering means.

4,066,029

ELECTROMECHANICAL REMOTE CAM SELECTOR FOR SEWING MACHINES

Alfred R. Suchsland, Morris Plains, and Terry L. Wilson, Parsippany, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Jan. 12, 1976, Ser. No. 648,077
Int. Cl.[2] D05B *3/02*
U.S. Cl. 112—158 E **16 Claims**



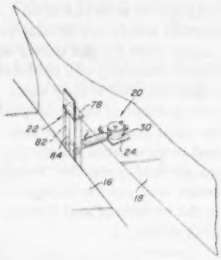
1. In a sewing machine having stitch forming instrumentalities, mechanism in said sewing machine responsive to pattern information for regulating at least one of said stitch forming instrumentalities including, a plurality of aligned pattern cams each carrying pattern information, pattern cam follower means including a single cam follower for selectively sensing the pattern information from said pattern cams and for regulating the stitch forming instrumentalities, adder means operably connected to said cam follower means for selectively associating said pattern cam follower means with a pattern cam, and electric switch means for selecting individual patterns of stitches, said switch means being connected to said adder means for initiating association of said pattern cam follower means with a pattern cam carrying pattern information corresponding to the selection of said switch means.

4,066,030

MECHANICAL COUPLING FOR MARINE VEHICLES

Louis Milone, 531 Jefferson St., New Orleans, La. 70121

Filed Mar. 1, 1976, Ser. No. 662,973
Int. Cl.[2] B63B *21/00, 21/56*
U.S. Cl. 114—230 13 Claims



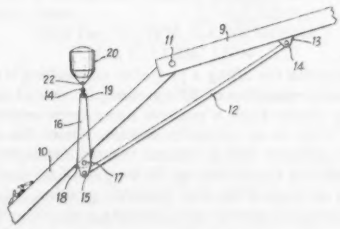
12. A mechanical coupling for marine vehicles including:
a. a first member having a vertically disposed track member,
b. a second member having an elongated shaft including a locking portion at one end thereof for engagement with said vertically disposed track member,
c. means for rotating said elongated shaft for selectively engaging said locking portion thereof with, and disengaging the same from, the vertically disposed track member,
d. said second member including a housing through which said elongated shaft extends,
e. means on said housing engageable with the periphery of said elongated shaft for selectively locking said elongated shaft to prevent rotational movement thereof,
f. a retaining member within said housing in sleeved engagement with said elongated shaft, and
g. locking means extending through said retaining member into securing engagement with said shaft for preventing longitudinal movement of said elongated shaft with respect to said housing.

4,066,031

DEVICE FOR REGULATION OF ANCHORAGE FORCES

Jean Louis Corgnet, Boulogne, France, assignor to Compagnie Francaise des Petroles, Paris Cedex, France

Filed Sept. 9, 1976, Ser. No. 721,929
Claims priority, application France, Sept. 26, 1975, 75.29523
Int. Cl.[2] E02B *17/00*
U.S. Cl. 114—294 5 Claims



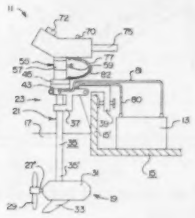
1. An anchor arm for anchoring a floating body to a submerged anchor point comprising anchor means adapted to be secured at the bottom of a body of water for pivotal movement about a vertical axis, upper and lower anchor arm parts articulated to each other and to said floating body and said anchor means respectively and force regulating means for regulating the forces transmitted to the anchor arm by said floating body including articulated coupling means connected to said upper and lower arm parts on opposite sides of their articulation and float means connected to said articulated coupling means to impart a force to said anchor arm parts opposite to the forces transmitted by said floating body to said upper and lower arm parts.

4,066,032

ELECTRICALLY POWERED OUTBOARD MOTOR MEANS

Calvin C. Travis, 1735 Coleen Road, Memphis, Tenn. 38111

Filed Dec. 13, 1976, Ser. No. 750,258
Int. Cl.[2] B63H *21/26*
U.S. Cl. 115—18 E 10 Claims



1. An improved electrically powered outboard motor means of the type for causing a boat to move upon a body of water and having drive means including a water submersible electric motor and a propeller member rotatably driven by said electric motor, having shaft means fixedly attached to said electric motor of said drive means, having attached means for movably attaching said shaft means to the boat with said drive means positioned beneath the surface of the body of water, and having circuit means including a first conductor member movably mounted about said shaft means for selectively receiving electrical power from a source of electrical power and including a second conductor substantially nonrotatably mounted about said shaft means when said motor means is being used in a normal manner to cause a boat to move upon a body of water for selectively transferring electrical power from said first conductor member to said electric motor when said first and second conductor members are contacting one another, wherein the improvement comprises: movably attaching said second conductor member to said shaft means for allowing said second conductor member to remain in contact with said first conductor member when said shaft means is raised or lowered relative to said first conductor member.

4,066,033

OVER INFLATION AND UNDER INFLATION INDICATOR FOR TIRES

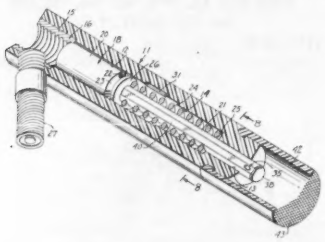
Robert A. Perry, 777 Grape St., Riverside, Calif. 92507, and Placido Martos, 12021 Holston Ave., La Mirada, Calif. 90638

Filed May 21, 1976, Ser. No. 688,711
Int. Cl.[2] B60C *23/04*
U.S. Cl. 116—34 R 5 Claims

1. A device for indicating an abnormal air pressure within a tire comprising,
a housing having a bore therein,
means for mounting said housing with one end of said bore in communication with the interior of said tire,
the opposite end of said bore being in communication with the atmosphere,
said bore in the housing having a sealing section and a relieved section,
a piston in said bore, said piston having a portion extending beyond said opposite end of said bore,
sealing means on said piston,
said piston being acted on by air from said tire to urge said piston toward said opposite end of said bore,
biasing means for urging said piston toward said one end of said bore,

said air overcoming said biasing means to cause said piston to locate said sealing means in engagement with said sealing section when said air is at an optimum pressure whereby to prevent movement of said air along said bore and between said piston and said bore,

said biasing means overcoming said air to locate said sealing means over said relieved section when said air is at any of different abnormal pressures whereby .o permit move-



ment of said air along said bore and between said piston and said bore, and

means responsive to movement of said air along said bore for producing an indicating signal comprising whistle means on the extending portion of said piston,

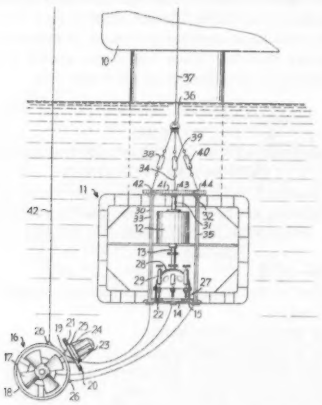
said device having a channel formed by a flat portion of the piston coacting with a portion of the housing at the top to convey air to said whistle means to impinge upon the whistle means and thereby produce said indicating signal.

4,066,034

APPARATUS FOR MOUNTING AND DISMOUNTING A SUBMERGED PROPELLER UNIT FOR A FLOATING BODY

Kjell Haglund, Karlstad, Sweden, assignor to Aktiebolaget Karlstads Mekaniska Werkstad, Karlstad, Sweden

Filed June 1, 1976, Ser. No. 691,778
Claims priority, application Sweden, June 6, 1975, 7506472
Int. Cl.² B63H *1/14*
U.S. Cl. 115—34 R **3 Claims**



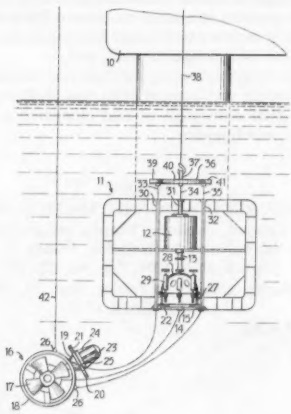
1. Apparatus for lifting a propeller unit having a mounting flange and a plurality of lifting elements spaced about said mounting flange from a position away from and beneath a floating body to an assembly position where the mounting flange is adjacent and in proper relation for assembly to a flange defining an opening in the bottom of the body, or for lowering it away from said assembly position, wherein the improvement comprises means forming a plurality of passageways extending downwardly through the body from inlet ports in the top of the body to outlet ports in the bottom of the body and spaced about said opening therein, a plurality of cables threaded through said respective passageways and extending below said outlet ports, means connecting the upper ends of said cables to a common hoisting cable, means at the lower end of each cable for coupling the cable to one of said propeller unit lifting elements, respectively, means enabling adjustment of the length of at least one of said cables, and cable spreader means disposed between the inlet ports of said passageways and the upper ends of said cables and having cable receiving portions for maintaining said cables in predetermined lateral spatial arrangement where they enter said inlet ports, the lateral spatial arrangement of said inlet ports, passageways, outlet ports and the cable receiving portions of said spreader means being disposed in substantial conformity with the lateral spatial arrangement of said propeller unit lifting elements, whereby said propeller unit can be brought into proper position for assembly to the bottom of said floating body by raising said common hoisting cable.

4,066,035

APPARATUS FOR MOUNTING AND DISMOUNTING A SUBMERGED PROPELLER UNIT FOR A FLOATING BODY

Kjell Haglund, Karlstad, and Hakan Hasse Carlsson, Kristinehamn, both of Sweden, assignors to Aktiebolaget Karlstads Mekaniska Werkstad, Karlstad, Sweden

Filed June 1, 1976, Ser. No. 691,840
Claims priority, application Sweden, June 6, 1975, 7506471
Int. Cl.² B63H *5/06*
U.S. Cl. 115—34 R **2 Claims**



1. Apparatus for lifting a propeller unit having a mounting flange and a plurality of lifting elements spaced about said mounting flange from a position away from and beneath a floating body to an assembly position where the mounting flange is adjacent and in proper relation for assembly to a flange defining an opening in the bottom of the body, or for lowering it away from said assembly position, wherein the improvement comprises means forming a plurality of passageways extending downwardly through the body from inlet ports in the top of the body to outlet ports in the bottom of the body and spaced about said opening therein, a plurality of cables threaded through said respective passageways and extending below said outlet ports, a yoke supporting above the body, means connecting the upper ends of said cables to said yoke, and means at the lower end of each cable for coupling the cable to one of said propeller unit lifting elements, respectively, said passageways and said means connecting the cables to said yoke being disposed in correspondence with the spatial arrangement of said propeller unit lifting elements, whereby

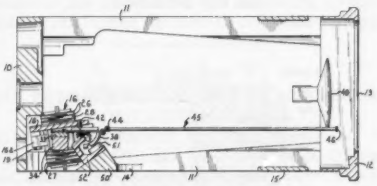
said propeller unit can be brought into proper position for assembly to the bottom of said floating body by raising said yoke.

4,066,036

COMMAND BAR SYSTEM

James Nelson Harrington, Olathe, Kans., assignor to King Radio Corporation, Olathe, Kans.

Filed Nov. 18, 1976, Ser. No. 742,751
Int. Cl.[2] G01D *13/00*
U.S. Cl. 116—114 R **10 Claims**



1. A command bar device for providing pitch and roll information, said device comprising:

a frame;

a magnet assembly including a permanent magnet;

means mounting said magnet assembly to said frame for pivotal movement about a pair of mutually perpendicular axes corresponding to pitch and roll axes;

a command bar coupled with said magnet assembly for movement therewith about said axes;

a pair of coils supported on said frame in proximity to said magnet, said coils being operable to receive current to produce fields for selectively deflecting said magnet in a manner to pivot said magnet assembly about each of said axes, thereby displacing said command bar with respect to said axes in movement corresponding to pitch and roll movement; and

means providing an indication of the direction and extent to which said command bar is displaced with respect to said axes.

4,066,037

APPARATUS FOR DEPOSITING DIELECTRIC FILMS USING A GLOW DISCHARGE

Adir Jacob, Framingham, Mass., assignor to LFE Corportion, Waltham, Mass.

Filed Dec. 17, 1975, Ser. No. 641,441
Int. Cl.[2] C23C *13/04*
U.S. Cl. 118—49.1 **4 Claims**

1. Apparatus for depositing a film on a substrate comprising:

a reaction chamber,

means for closing said chamber,

means for continuously evacuating said chamber,

means for dispersing a first gas within said chamber,

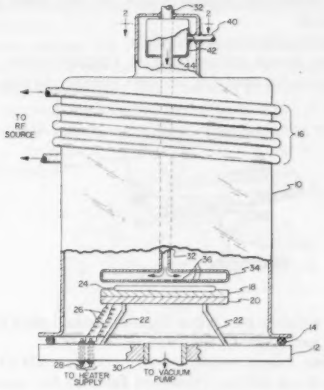
gas excitation means external of said chamber for activating said first gas and forming an RF glow discharge zone within a portion of said chamber,

substrate support means positioned within said chamber beyond said glow discharge zone,

said substrate support means comprising a metallic plate having a recess therein for accepting a substrate and having heater means associated therewith for maintaining said plate at a temperature in excess of 200° C,

and means for dispersing a second gas within said chamber beyond said glow discharge zone and adjacent said substrate support means,

whereby said activated first gas and said second gas react in the vicinity of said substrate support means to deposit a



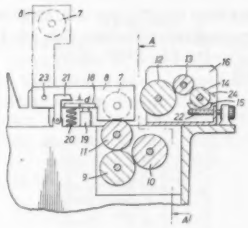
film on a substrate positioned on said substrate support means.

4,066,038

PRINTING AND COATING APPARATUS

Orin S. Shutie, Greenford, and Leonard A. Jenkins, Newbury, both of England, assignors to Metal Box Limited, England

Filed July 13, 1976, Ser. No. 704,789
Claims priority, application United Kingdom, July 23, 1975, 30728/75
Int. Cl.[2] B05C *1/02*
U.S. Cl. 118—218 **8 Claims**



1. Apparatus for coating a hollow article, said apparatus comprising a mandrel adapted to support an article and rotatably mounted on an arm pivotable from an article feeding position to first and second coating positions, a first holding means to hold the arm in a first coating position, a first coating means adjacent said first coating position, a second holding means to hold the arm in a second coating position intermediate said first coating position and said article feeding position, and a second coating means at said second coating position.

4,066,039

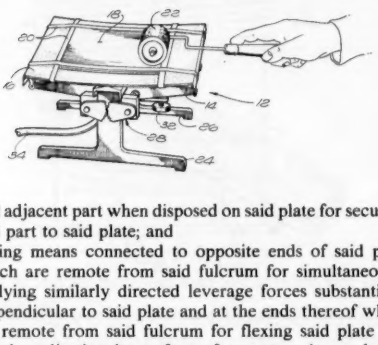
ADJUSTABLE SECURING BASE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Paul P. Zebus, Lakewood, and Poley N. Packer, Long Beach, both of Calif.

Filed Sept. 7, 1976, Ser. No. 721,150
Int. Cl.[2] B05C *13/00*
U.S. Cl. 118—500 **5 Claims**

1. An adjustable securing base having a surface contour of curvature which can be adjusted to support an adjacent part on said surface of curvature comprising:

a flexible thin plate forming said securing base, said plate being of elongate configuration and having a pair of ends;
a fulcrum secured to the underside of said plate and extending along the central width of said plate in support thereof;
an opening formed in said plate;
vacuum means connectable in communication with said opening for applying vacuum pressure to one surface of



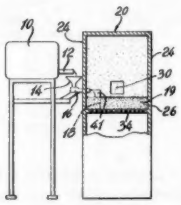
said adjacent part when disposed on said plate for securing said part to said plate; and
adjusting means connected to opposite ends of said plate which are remote from said fulcrum for simultaneously applying similarly directed leverage forces substantially perpendicular to said plate and at the ends thereof which are remote from said fulcrum for flexing said plate and thereby adjusting its surface of curvature in a selected convex or concave configuration.

4,066,040

CONTINUOUS POWDER FEED SYSTEM FOR MAINTAINING A UNIFORM POWDER COATING THICKNESS ON OBJECTS BEING COATED BY ELECTROSTATIC FLUIDIZED BEDS

Michael A. Dudley, Toronto; Mellapalayam R. Parthasarathy, Verdun, and Douglas C. Nerthersole, Laval, all of Canada, assignors to Canada Wire and Cable Limited, Toronto, Canada

Filed May 6, 1976, Ser. No. 683,775
Claims priority, application Canada, Feb. 26, 1976, 246616
Int. Cl.[2] B05C *19/02*
U.S. Cl. 118—629 **10 Claims**



1. A continuous powder feed system for feeding powder to and removing it from the coating bed of an electrostatic fluidized bed coating unit of the type wherein an object to be coated is passed through a cloud of electrically charged particles located above the fluidized powder bed, such as to maintain an essentially uniform powder cloud above the bed comprising:
a. a powder container and discharger means for continuously feeding powder into said coating bed in an essentially non-agglomerated form;
b. means for channelling the powder entering the coating bed away from the coating area initially to facilitate optimum electrostatic charging of the powder prior to deposition;
c. powder retaining wall means for containing the bed of said coating unit during fluidization comprising a plurality of powder retaining walls, at least one of said powder retaining walls having a height such as to determine the powder level in the coating bed and permitting a uniform overflow of excess powder from the coating bed across the length of said at least one of said powder retaining walls; and
d. a powder collection system for retrieving the overflowing powder from the coating bed.

4,066,041

APPARATUS FOR ELECTROSTATICALLY APPLYING COATING MATERIAL TO ARTICLES AND THE LIKE

Karl Buschor, and Peter Ribnitz, both of St. Gallen, Switzerland, assignors to Gema AG Apparatebau

Filed Apr. 2, 1976, Ser. No. 672,955
Claims priority, application Switzerland, Apr. 11, 1975, 4661/75
Int. Cl.[2] B05B *5/02*
U.S. Cl. 118—629 **4 Claims**

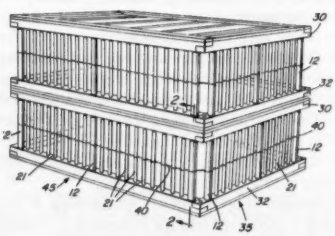
1. An apparatus for electrostatically applying coating materials to articles, comprising infeed means for delivering the coating material, means for the airless atomization of the coating material including a nozzle cooperating with said infeed means, an electrode arrangement to which there is applied high-voltage for electrically charging the coating material and for maintaining an electrical field for the transport of the charged material particles of the coating material to the article to be coated, said electrode arrangement comprising at least two electrodes arranged at the region of said nozzle having means connected thereto for applying a high-voltage of the same polarity but different magnitudes to said electrodes, said nozzle having a nozzle opening, and the electrical field between said electrodes covering said nozzle opening in the form of a transverse field, said electrodes comprising wires extending substantially parallel to the axis of the spraying jet of the coating material applied to the article, said wires possessing essentially the same spacing from said nozzle opening.

4,066,042

HOLLOW PLASTIC COOP DOWELS WITH WOOD CORE

Charles R. Bright, 805 Spring Valley Drive, Nacogdoches, Tex. 75961

Filed Jan. 27, 1976, Ser. No. 652,814
Int. Cl.[2] A01K *31/07*
U.S. Cl. 119—19 **7 Claims**



1. A coop for poultry and the like having top and bottom panels of wood or like material, opening means for access to the interior of said coop, two side panel frame members and two end panel frame members appropriately formed by spaced

dowel construction between the top and bottom panels, the end and side panels each including a number of dowels spaced along the periphery of the frame members, the improvement comprising; means to substantially increase the strength of the over-all coop and reduce repair and maintenance required on same, including reinforcing structure to cover selected ones of the dowels, said reinforcing structure including double layer compartmentalized tubing structure of sufficient length to extend between and in positive contact with the top and bottom panels, the tubing structure further including an inner tube spaced from an outer tube by means of longitudinal spacers extending radially between the outer side of the inner tube and the inner side of the outer tube with said entire structure being formed of plastic material, and additional means between at least some of the dowels and the reinforcing structure for substantially reinforcing the over-all coop construction.

4,066,043

FUEL REFORMING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

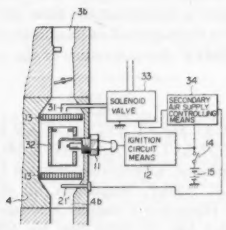
Masaaki Noguchi, Nagoya; Masaharu Sumiyoshi, Toyota; Yukiyasu Tanaka, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Division of Ser. No. 487,785, July 11, 1974. This application Feb. 27, 1976, Ser. No. 662,254

Claims priority, application Japan, July 26, 1973, 48-84345; July 26, 1973, 48-84348; Nov. 15, 1973, 48-128617; Nov. 19, 1973, 48-129988; Nov. 20, 1973, 48-130905; Mar. 12, 1974, 49-28876

Int. Cl.[2] **F02B** *43/08*

U.S. Cl. 123—3 **9 Claims**



1. A fuel reforming system for an internal combustion engine operable with a hydrocarbon fuel comprising:

a passage for a rich mixture of air and the fuel,

at least a single spark plug disposed in said passage for imperfectly burning a part of said rich mixture in said passage to reform and vaporize the fuel contained in said rich mixture,

a secondary air intake pipe having an open end disposed in said passage upstream of said spark plug for supplying a secondary air to said passage, and

means for controlling said imperfect burning of said rich mixture.

4,066,044

ROTARY ENGINE WITH TONGUE AND GROOVE INSERTS IN ROTOR FACES

Charles Jones, Hillsdale, and Robert William Loyd, Jr., Wyckoff, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Sept. 9, 1976, Ser. No. 721,675

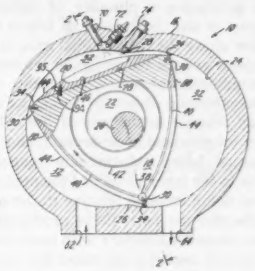
Int. Cl.[2] **F04B** *55/02*

U.S. Cl. 123—8.09 **6 Claims**

1. A rotor for a rotary combustion engine, said rotor comprising:

a. a main portion having a generally polygonal profile such that said rotor has a plurality of circumferentially spaced apex portions and a plurality of working surfaces with each working surface of said rotor extending between adjacent apex portions, said rotor main portion having a plurality of internal compartments for the circulation of a cooling medium therethrough with each of the rotor apex portions having one of said compartments disposed adjacent thereto;

b. an insert member for each working surface of said rotor with each insert member being elongate to extend circumferentially substantially from one apex portion to the other of its working surface but terminating short of the apex seals of said apex portions to overlie the major portion of



said working surface and having an outwardly facing recess; and

c. means including a tongue and groove fit for securing each insert member to the rotor so as to leave a gap between the major portion of the facing surfaces of said insert and rotor, each tongue and groove fit for an insert member running in a generally circumferential direction between associated apex portions of the rotor to permit circumferential thermal expansion and contraction of the periphery of said insert member relative to the rotor.

4,066,045

INTERNAL COMBUSTION ENGINE PROVIDED WITH PRECOMBUSTION CHAMBER

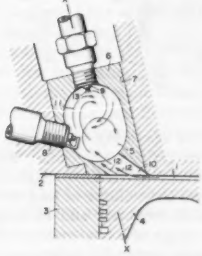
Takao Suzuki, Shizuoka, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 19, 1975, Ser. No. 551,023

Claims priority, application Japan, Aug. 8, 1974, 49-90996

Int. Cl.[2] **F02B** *19/00*

U.S. Cl. 123—30 D **1 Claim**



1. An internal combustion engine comprising:

a cylinder;

a cylinder head;

a piston reciprocably disposed in said cylinder;

a main combustion chamber defined by said piston, said cylinder, and said cylinder head;

a precombustion chamber in said cylinder head, said precombustion chamber having a longitudinal axis;

an ignition plug in said precombustion chamber;

a fuel injection nozzle in said precombustion chamber;

means defining a passage communicating said main combustion chamber and said precombustion chamber, one end of said passage opening into said main combustion chamber and the other end thereof opening directly into one end of said precombustion chamber in a direction directly toward said ignition plug, said passage having a cross-sectional area of 1 to 10% of that of said cylinder;

said fuel injection nozzle is positioned adjacent the other end of said precombustion chamber;

said ignition plug is positioned between said passage and said fuel injection nozzle; and

means for producing a plurality of substantially circular swirl flows of air, the centers of which are spaced from each other along the longitudinal axis, in the precombustion chamber and for reducing the velocity of the flows in the precombustion chamber, said means comprising:

said precombustion chamber having its longitudinal axis inclined relative to the axis of the cylinder and being oval in longitudinal cross-section; and

said passage being substantially tangentially disposed relative to the inner surface of the precombustion chamber and being inclined relative to the axis of said cylinder whereby the swirl flows produced in the precombustion chamber interfere with each other as a result of their spaced centers to decrease the velocity of the swirl flows so that flame propagation of a fuel mixture charge is lowered and the amount of NO_x in exhaust gas is reduced.

4,066,046

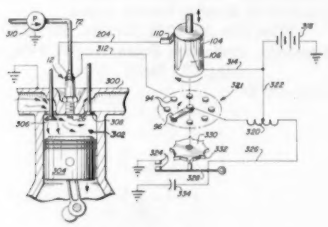
METHOD AND APPARATUS FOR FUEL INJECTION-SPARK IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Roy E. McAlister, 5285 E. Red Rock Drive, Phoenix, Ariz. 85018

Continuation of Ser. No. 492,548, July 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 232,575, March 7, 1972, Pat. No. 3,830,204. This application Sept. 8, 1976, Ser. No. 721,505

Int. Cl.[2] F02B *17/00*

U.S. Cl. 123—32 ST **18 Claims**



1. A method of operating an internal combustion engine having a chamber defined by positive displacement elements which are relatively movable through successive cycles of operation wherein the volume of said chamber increases and decreases between maximum and minimum values having a ratio within the range of a conventional spark ignition engine and a pair of spaced electrodes defining an electrical discharge path within said chamber when at a minimum value thereof, said method comprising the steps of:

introducing during each cycle of operation into said chamber a charge of oxidizing gas substantially free of combustible fuel,

compressing during each cycle of operation said oxidizing gas substantially to a volume near said minimum value by the decreasing relative movement of said positive displacement elements,

injecting during each cycle of power operation a combustible fuel as a high pressure jet directly into the oxidizing gas within said chamber at a predetermined time during the compression thereof prior to said positive displacement elements decreasing said chamber to said minimum value in a direction toward one of said electrodes and away from the other electrode so that there is established before the completion of said fuel injection within the chamber space containing said discharge path an interface between the oxidizing gas contacting said other electrode and the injected fuel moving away from said other electrode which presents a range of fuel-oxidizing gas mixture ratios which inherently includes ignitable mixture ratios and mixture ratios both too-fuel-rich and too-fuel-lean to ignite,

causing during each cycle of power operation an electrical current to discharge between said electrodes within said chamber space along said path while said injection is taking place so as to ignite the mixture of oxidizing gas and fuel therein having an ignitable mixture ratio and to establish a flame front which continues by virtue of the continued injection of fuel and the mixture thereof with oxidizing gas within the chamber under the dynamic fluid conditions occasioned by the injected fuel momentum and the relative movement of the positive displacement elements defining the chamber so that substantially the entire charge of injected fuel is burned within an envelope of oxidizing gas in contact with the surfaces of said positive displacement elements defining said chamber,

continuously sensing the speed of rotation of said engine and the position of a speed control mechanism for said engine, and

utilizing the sensed engine speed and speed control mechanism position to determine the time said injection is initiated and the timer period of its continuation so as to optimize the BMEP characteristics of the engine.

4,066,047

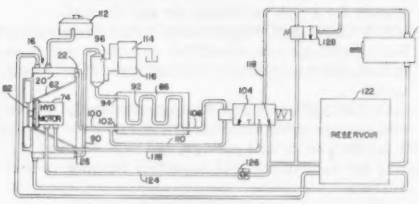
TOROIDAL HEAT EXCHANGER HAVING A HYDRAULIC FAN DRIVE MOTOR

Aleksandar Vidakovic, Libertyville; Stanley Urman, Waukegan, and Donald F. Rudny, Mundelein, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Apr. 19, 1976, Ser. No. 678,266

Int. Cl.[2] F01P *7/02, 11/08*

U.S. Cl. 123—41.12 **6 Claims**



1. In a vehicle having an engine means generating a plurality of heated fluids an apparatus for affecting the heat content of said fluids, said apparatus comprising:

a toroidal heat exchanger having a plurality of annular ring sections, each section having an inlet header tank and an outlet header tank equipped with respective inlet and outlet ports and a plurality of core elements connecting respective inlet and outlet header tanks allowing fluid passage from the inlet header tanks to the outlet header tanks;

conduit means connecting said inlet and outlet header tanks to fluid sources of said engine for allowing fluid communication between said engine and said toroidal heat exchanger;

one of said fluid sources being an engine cooling fluid and at least one of hydraulic operating fluid and lubricating fluid;

a support cone being truncated above the base thereof to form a conical frustrum located in the interior portion of the toroidal heat exchanger surrounded by said core elements thereof, the truncated portion of the support cone covered with a plate having a plurality of apertures therein;

a hydraulic motor having an output shaft, said motor affixed to said plate of said support cone, said output shaft projecting through an aperture in said plate, the hydraulic motor located completely inside said support cone;

a fan having multiple blades carried on said hydraulic motor shaft, said fan blades being positioned outboard of said annular ring sections of said toroidal heat exchanger;

a source of pressurized hydraulic fluid for driving said hydraulic motor;

hydraulic fluid conduit allowing fluid communication between said source of pressurized hydraulic fluid and said hydraulic motor;

a normally closed temperature responsive spool valve for controlling hydraulic fluid flow to said hydraulic motor from said source of hydraulic fluid interposed between said hydraulic fluid source and said hydraulic motor;

conduit means allowing communication of heat fluid from said engine to said temperature responsive spool valve whereby said temperature responsive spool valve is caused to open such that said hydraulic motor receives hydraulic fluid from said source of hydraulic fluid in response to the displacement of said spool valve.

4,066,048

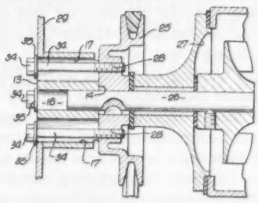
UNIVERSAL AXIAL SPACER FOR MOUNTING FAN ON PUMP SHAFT AND DRIVE PULLEY

Donald D. Premus, 555 E. Ramsey St., Banning, Calif. 92220

Continuation of Ser. No. 621,011, Oct. 9, 1975, abandoned. This application Mar. 29, 1977, Ser. No. 782,357

Int. Cl.² F01D *7/10, 7/04;* **F16H** *7/22*

U.S. Cl. 123—41.49 **6 Claims**



1. In a fan spacer adapted to unite existing fans with existing pump drive shafts and pulleys on an engine, the combination of

a spacer body having a bore adapted either without reaming, or with reaming, where required, to fit any of said shafts;

an axial fan centralizing boss on one end of said body, said boss fitting a bore already provided in one group of said fans;

four primary radial slots in said body for accommodating four parallel bolts disposable freely at varying radii from the axis of said body and screwing into tapped holes already provided in said pulleys to secure said body axially to one of said pulleys; and

four secondary radial slots in said body equally interspersed circumferentially between said primary radial slots and accommodating another four bolts for securing said fan to said body by extending said bolts through said secondary slots and through bolt holes already provided in said fan.

4,066,049

INTERNAL COMBUSTION ENGINE HAVING A VARIABLE ENGINE DISPLACEMENT

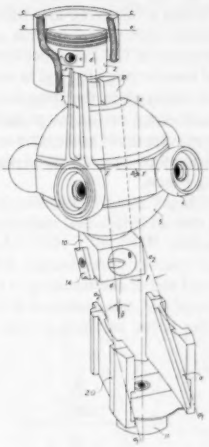
Gheorghe Marcel Teodorescu, Bucharest, and Aurel Popa, Breaza, both of Romania, assignors to Institutul National Pentru Creatie Stintifica si Tehnica - Increst, Bucharest, Romania

Filed Aug. 29, 1975, Ser. No. 609,095

Claims priority, application Romania, Sept. 2, 1974, 79892

Int. Cl.² F02B *75/04*

U.S. Cl. 123—48 R **8 Claims**



1. An internal-combustion engine having a variable engine displacement comprising:

a housing having a generally centrally located axis;

an odd number of cylinders formed at a first end of said housing parallel to said axis and arranged in a circular array centered on said axis, said cylinders being equally spaced in said circular array and each of said cylinders being provided with a piston;

a movable ball in said housing centered on said axis and articulated to said pistons along an equator of said ball for producing a nutational movement thereof;

a drive shaft journaled in said ball having a shaft axis passing through the center thereof and perpendicular to the plane of said equator;

a first output shaft journaled at a second end of said housing along said axis of said housing;

slide means on said first output shaft engaging one end of said drive shaft for translating the nutational motion thereof to rotary motion, said plane being tiltable variably in response to the torque on said first output shaft;

a support on said housing mounted outwardly of said ball and shiftable toward and away from said cylinders journalling said ball and provided with means for biasing said ball along the axis of said housing and positioning said ball in an equilibrium position responsive to the load on said first output shaft.

4,066,050

TWO-STROKE I.C. ENGINES

Martin Douglas Ford-Dunn, Steyning, England, assignor to Ricardo & Co., Engineers (1927) Limited, Shoreham-by-Sea, England

Filed Dec. 18, 1975, Ser. No. 642,307

Claims priority, application United Kingdom, Dec. 18, 1974, 54633/74

Int. Cl.² F02B *33/04*

U.S. Cl. 123—73 SP **7 Claims**

1. A two-stroke internal combustion throttle controlled

engine with crankcase compression and scavenging, comprising:

a cylinder having a wall,

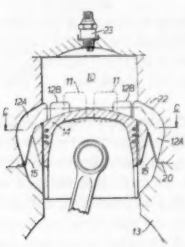
a piston slidable inside the cylinder wall upwardly by a compression stroke to a top dead center position and downwardly by a working stroke to bottom dead center position,

a crankcase below said cylinder and having an inlet port for receiving a throttle controlled combustible air-fuel gaseous mixture which is subject to compression within the crankcase by said piston during its downward working stroke to effect a relatively low mixture pressure at low load operation with partial throttle and a relatively high mixture pressure at full load operation with full throttle,

a plurality of transfer ports formed in said cylinder wall with their upper limits all at the same predetermined distance below the top dead-center piston position and being controlled by movement of said piston so that all the transfer ports will start to be uncovered simultaneously by the descending piston,

exhaust port means in said cylinder wall and means to ensure operation thereof before said transfer ports are uncovered by said piston,

a plurality of transfer port passages extending through the cylinder wall and communicating at their lower ends with the interior of said crankcase and at their upper ends with said transfer ports, and hence with the upper working



space in the cylinder above the piston when the piston reaches a predetermined level on its downward working stroke and uncovers the transfer ports,

at least one but not all of said transfer port passages having an unrestricted gas flow path from end to end for scavenging the said upper working space in the cylinder by the said mixture compressed during each downward working stroke, and

means for improving the scavenging effectiveness of said mixture and combustion conditions during said low load operation by increasing then the velocity of said mixture via at least said one passage and respective transfer port into said upper working spaces,

said velocity increasing means being characterized by gas pressure responsive check valve means disposed in at least one other of said transfer passages and responsive solely to the pressure of said mixture in said crankcase and being normally biased towards its closed position for restricting passage of said low pressure mixture through said other transfer passage during said low load operation and thereby increasing the said velocity at said one port to cause said improved scavenging and combustion conditions,

said valve means being automatically opened up by the relatively high pressure of said crankcase mixture at said full load operation and by intermediate crankcase pressures which exceed the pressure in said upper working space in said cylinder.

4,066,051

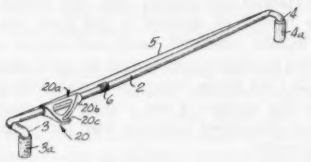
TRAINING AID FOR ARCHERY

John M. Alban, 173 Fr. Zeiser Place (W. 188th St.), Bronx, N.Y. 10468

Continuation-in-part of Ser. No. 156,796, June 25, 1971, abandoned. This application May 2, 1974, Ser. No. 466,200

Int. Cl.² F41B *5/00*

U.S. Cl. 124—86 **10 Claims**



1. An archery training aid for use with a longbow having a central bow handle disposed between two limb members and a bow string attached at opposite ends to and tautly spanning the free ends of said limb members, said aid comprising:

a. means for spanning a central bow handle and a bow string of a drawn longbow, said spanning means having a thickness adapted to permit it to pass between two fingers of an archer so that prior to drawing a longbow the forward end of said spanning means may be held by one hand of an archer along with a central bow handle, while the other hand of the archer grasps a bow string and the opposite end of said spanning means;

b. a first handle at said opposite end of said spanning means, said first handle having a thickness adapted to permit it to be gripped by a drawing hand of an archer along with a bow string and an end of an arrow;

c. a second handle at the forward end of said spanning means, said second handle being oriented transversely to the axis of said spanning means and having a thickness adapted to permit it to be gripped by a bow-gripping hand of an archer in conjunction with a central bow handle for securing said second handle to a central bow handle when a longbow is drawn; and

d. a knocking member mounted on said spanning means adjacent said second handle and having a notch therein for accommodating a bow string.

6. An archery training aid for use with a longbow having a central bow handle disposed between two limb members and a bow string attached at opposite ends to and tautly spanning the free ends of said limb members, said aid comprising:

a. means for spanning a central bow handle and a bow string of a drawn longbow, said spanning means having a thickness adapted to permit it to pass between two fingers of an archer so that prior to drawing a longbow the forward end of said spanning means may be held by one hand of an archer along with a central bow handle, while the other hand of the archer grasps a bow string and the opposite end of said spanning means;

b. a first handle at said opposite end of said spanning means, said first handle having a thickness adapted to permit it to be gripped by a drawing hand of an archer along with a bow string and an end of an arrow;

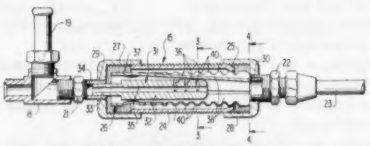
c. a second handle at the forward end of said spanning means, said second handle being oriented transversely to the axis of said spanning means and having a thickness adapted to permit it to be gripped by a bow-gripping hand of an archer in conjunction with a central bow handle for securing said second handle to a central bow handle when a longbow is drawn; and

d. attaching means on said spanning means for attaching said spanning means to a drawing arm of an archer.

4,066,052
EXHAUST RECYCLING AND CARBON MONOXIDE ELIMINATOR FOR COMBUSTION ENGINES

Leota J. Moore, 910 Lake Shore Drive, Chicago, Ill. 60611, and Robert G. Landwer, 1454 W. Argyle, Chicago, Ill. 60640

Filed Oct. 21, 1976, Ser. No. 734,438
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **9 Claims**

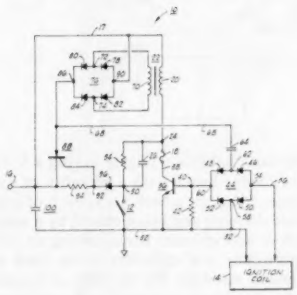


1. A device for recycling combustion products in an internal combustion engine to remove carbon monoxide therefrom and to more completely burn the combustion products comprising a sleeve member forming a housing, conduit means coupling opposite ends of said sleeve member to an engine exhaust and engine fuel induction means, a male jet element supported centrally within said sleeve member in spaced relation thereto and being coaxial therewith and extending through a major portion of the length of the sleeve member and having a downstream end terminating within the sleeve member, said male jet element having a central axial bore formed therethrough from end-to-end and having plural circumferentially spaced longitudinal rows of radial ports leading from the central axial bore and opening through the peripheral surface of the male jet element approximately at the longitudinal center zone of the sleeve member, and a coacting female sleeve element inside of said sleeve member and being supported thereby in coaxial surrounding relationship to the male jet element, said female sleeve element having a plurality of elongated circumferentially spaced fingers of channel form extending for the major portion of its length and said fingers having free separated ends at the downstream end of the device, and said fingers having toothed longitudinal edges.

4,066,053
ELECTRONIC IGNITION SYSTEM

John B. Noe, Norman, Okla., assignor to Plasmatronics Company, Norman, Okla.

Continuation-in-part of Ser. No. 605,533, Aug. 18, 1975, Pat. No. 4,005,694. This application Nov. 15, 1976, Ser. No. 741,542
Int. Cl.[2] F02P *1/00*
U.S. Cl. 123—148 CA **11 Claims**



1. An electronic ignition circuit for use in combination with an internal combustion engine having an electrical power source and ignition means for energization of at least one spark discharge device, comprising:

a capacitor;

switch means actuatable between open and closed positions;

means including a transformer connected to said power source and energized by said switch in the closed position to charge said capacitor to an increased voltage value;

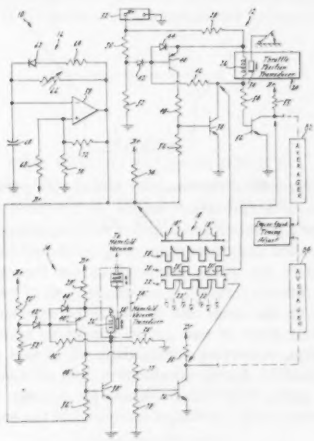
controlled rectifier means having the cathode connected to said power source and the anode connected to said capacitor, which controlled rectifier means is energized by opening said switch means to effect discharge of said capacitor; and

bridge rectifier means connected to conduct current from discharge of said capacitor to said ignition means while clamping the instantaneous voltage value relative to ground.

4,066,054
TRANSDUCER CIRCUITS

LaVerne Andrew Caron; Lawrence William Tomczak, both of Sterling Heights, and Frederick William Crall, Farmington, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Division of Ser. No. 559,203, March 17, 1975, Pat. No. 3,997,801. This application Dec. 22, 1975, Ser. No. 642,924
Int. Cl.[2] F02P *5/04;* **F02B** *3/00*
U.S. Cl. 123—117 R **8 Claims**



1. In combination:

an internal combustion engine whose operation is controlled in accordance with a pair of mechanical input signals, each of which is representative of a corresponding engine operating parameter;

an oscillator circuit comprising means for generating trigger pulses at a substantially constant triggering frequency which is independent of engine speed;

a first monostable circuit which is operatively coupled with said oscillator circuit to receive each said trigger pulse and is immediately tripped upon receipt thereof into its unstable state to develop a first rectangular signal waveform having a frequency exactly equal to that of said trigger pulses and an average value representative of one of said mechanical input signals;

a second monostable circuit which is operatively coupled with said oscillator circuit to receive each said trigger pulse and is immediately tripped upon receipt thereof into its unstable state to develop a second rectangular signal waveform having a frequency exactly equal to that of said trigger pulses and an average value representative of the other of said mechanical input signals;

first averaging circuit means coupled with said first monostable circuit for averaging said first waveform;

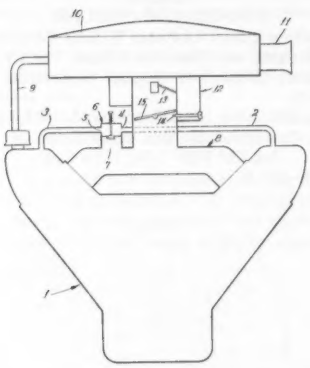
second averaging circuit means coupled with said second monostable circuit for averaging said second waveform;
and means responsive to the two averaged signals of said first and second averaging circuit means for controlling operation of the engine.

4,066,055

POSITIVE CRANKCASE VENTILATION SYSTEM

Lowell T. Hager, West Chicago, Ill., assignor to Clean Power Systems, Inc., West Chicago, Ill.

Division of Ser. No. 434,669, Jan. 18, 1974, Pat. No. 3,924,588.
This application Dec. 8, 1975, Ser. No. 638,979
Int. Cl.² F02M *7/00*
U.S. Cl. 123—119 B **3 Claims**



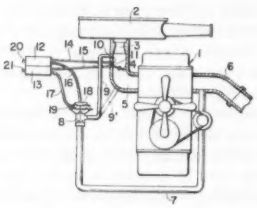
1. The method of continuously withdrawing gases from the crankcase of a carburetor engine of a vehicle to minimize atmospheric pollution and improve the operation of the engine which method comprises conveying crankcase gases from the crankcase to the intake manifold and/or the carburetor air intake as follows: conveying substantially all of the gases withdrawn from the crankcase to the carburetor air intake and substantially none of said gas to the intake manifold during acceleration, conveying substantially all of said gases to the intake manifold during deceleration, and continuously withdrawing gases from the crankcase for passage through the engine during other modes of operation of the engine.

4,066,056

EXHAUST GAS RECIRCULATOR

Hidetaka Nohira; Kiyoshi Kobashi, and Masaaki Tanaka, all of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 7, 1975, Ser. No. 629,982
Claims priority, application Japan, July 15, 1975, 50-85762
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **30 Claims**



1. An exhaust gas recirculator comprising:
a double diaphragm control valve positioned in a recirculation passage coupling an exhaust system and an intake system of an internal combustion engine, said valve comprising:
a valve shaft,
a valve seat,
a valve body on one end of said shaft for seating on said valve seat,
a first diaphragm and a second diaphragm, the center of each of which is fixed to the valve shaft, said second diaphragm having a larger cross-sectional area than that of said first diaphragm,
means, including said first diaphragm, defining a first pressure control chamber,
a spring in said first pressure control chamber, said spring biassing said valve shaft and valve body thereon toward a position in which said valve body is seated on said valve seat,
means, including said first diaphragm and said second diaphragm, defining a second pressure control chamber, and
the surface of said second diaphragm which is exterior to the second pressure control chamber being in fluid communication with atmospheric air whereby when vacuum is selectively introduced into said chambers, the movement of the valve shaft is controlled in two stages and the spacing of the valve body from the valve seat is changed in two stages so that the flow rate of recirculated exhaust gas can be regulated in two stages.

4,066,057

CYLINDER HEAD MOUNTING APPARATUS FOR INTERNAL COMBUSTION ENGINES

David Jerry Hale, Pickett, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sept. 4, 1975, Ser. No. 610,320
Int. Cl.² F02F *1/36*
U.S. Cl. 123—193 CH **8 Claims**

1. In an internal combustion engine having a V-block defining a pair of cylinder banks with a plurality of cylinders arranged as in-line cylinders in each bank, each of said cylinders having an outer sidewall and being closed by a separate cylinder head, each of said cylinder banks having an outer cooling jacket wall encircling said cylinders in the bank and spaced from the cylinder sidewalls for defining a separate cooling chamber about said cylinders in each bank, said separate cylinder head overlying each bank and closing the cylinders and the cooling chamber, said separate head providing the only closure of said cylinder and said cooling chamber, head attachment means secured to said sidewalls for securing of the head to the cylinder bank within the corresponding cooling chamber in inwardly spaced relation to the corresponding jacket wall

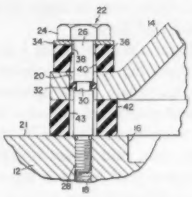
whereby each of the cooling chambers extends around said head attachment means and provides coolant flow around the head attachment means, said heads having the outer side edges beveled to reduce the width of the engine.

4,066,058

VIBRATION ISOLATION SYSTEM

Glenn Allan Anderkay, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 12, 1976, Ser. No. 685,455
Int. Cl.[2] E04B *1/99;* **F02B** *77/00*
U.S. Cl. 123—198 E **54 Claims**



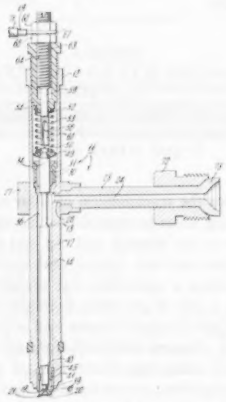
1. A vibration isolation system comprising: base means; cover means having an outer perimeter for mounting on the base means to cover the base means; securing means having head means for securing the cover means on the base means; a plurality of resilient isolating means disposed around the securing means and between the head means and the cover means having predetermined spring rates therebetween; and resilient isolating sealing material means substantially paralleling the outer perimeter of the cover means disposed between the cover means and the base means having a predetermined spring rate therebetween which is equal to or less than twice the sum of the predetermined spring rates of the plurality of resilient isolating means.

4,066,059

FUEL INJECTION NOZZLE VALVE AND IGNITION SYSTEM

Edward A. Mayer, Newburgh, and Jerry L. Nolting, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Jan. 2, 1976, Ser. No. 645,963
Int. Cl.[2] F02B *3/00;* **F02P** *5/04*
U.S. Cl. 123—32 SA **4 Claims**



1. In combination with an ignition system for an internal combustion engine that employs fuel injection,

an ignition coil having a high tension secondary winding for generating spark signals and a low tension primary winding for inducing said generation of spark signals, and

circuit means connected to said primary winding for controlling cutoff of a DC current therein, the improvement comprising

a fuel injection valve including a needle and having a closed position and an open position,

a valve seat adjacent to one end of said needle,

means for biasing said needle against said valve seat,

means for lifting said needle off said seat when said fuel injection pressure exceeds a predetermined amplitude,

said valve needle being electrically conductive,

electric circuit means integral with said valve for controlling said DC current cutoff when said valve goes from said closed to said open position,

said valve having means for electrically insulating said needle,

said electric circuit integral with said valve comprises said valve seat and means for making an electric circuit connection to said needle, and

said circuit means connected to said primary winding, also comprises

a transistor in series with said primary winding, and

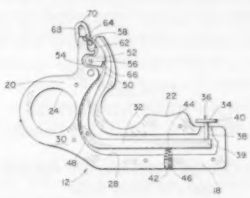
additional circuit means including said electric circuit means for controlling said transistor and comprising a plurality of said fuel injection valves connected in parallel.

4,066,060

BOW STRING RELEASE DEVICE

Loyd S. Napier, Rte. 1, Box 417A, Sapulpa, Okla. 74066

Filed May 7, 1976, Ser. No. 684,114
Int. Cl.[2] F41C *17/00*
U.S. Cl. 124—35 A **7 Claims**



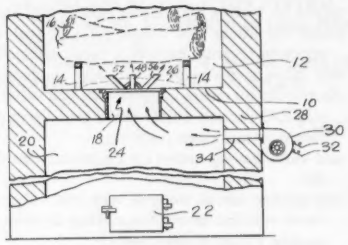
1. A draw and release device for a bow string and comprising generally L-shaped body means contoured for gripping by a hand and having a substantially coextensive L-shaped internal passageway means with an open end for receiving a bow string and provided therein with a substantially coextensive L-shaped pivotal bell crank means disposed within said passageway means for movement between latch means engaging and releasing positions, independent trigger means carried by said body means and operably connected with said bell crank means for selective pivoting said crank means to pivot bell crank so as to release a latch means from bow string engaging position, latch means pivotally secured within said body means and in communication with said passageway means for selective engagement by said bell crank means, flexible loop means secured to said body means for selective engagement with the bow string, loop receiving recess means provided on the outer periphery of said body means for removably receiving said loop means therein, said latch means extending transversely across said loop receiving recess means and being selectively engageable therewith for alternate opening and closing thereof to alternately retain and release said loop means with respect to said loop receiving recess means.

4,066,061

ASH COLLECTOR COVER AND COMBUSTION ENHANCER FOR A FIREPLACE

William E. Wolford, Rte. 3, Box 184 A, Batesville, Ark. 72501

Filed Oct. 29, 1976, Ser. No. 737,166
Int. Cl.² F23L 5/02
U.S. Cl. 126—135 **14 Claims**



1. In combination with a fireplace having a hearth, a combustion chamber position above said hearth, an ash collector positioned below said hearth, and an opening formed in said hearth leading to said ash collector, the improvement which comprises a combination ash collector cover and combustion enhancer, which comprises:

cover means comprising a substantially planar plate removably positioned over said ash collector opening of said fireplace;

pipe means comprising at least one air pipe extending outwardly from said plate for placing said combustion chamber of said fireplace in fluid communication with said ash collector, said at least one air pipe forming an air channel one end of which in use terminates below said combustion chamber but substantially above the plane of said plate for permitting ashes to accumulate on said plate without clogging said pipe; and

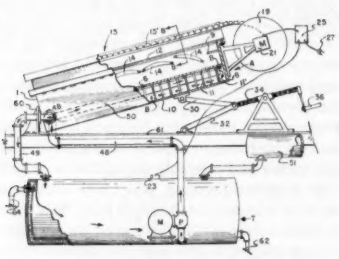
means for pressurizing said ash collector for causing air to flow therefrom through said pipe means into said combustion chamber so as to enhance combustion therein.

4,066,062

SOLAR HEATING SYSTEM

Elmer Houston, 2437 NW. 11th St., Oklahoma City, Okla. 73107

Filed Oct. 28, 1975, Ser. No. 626,455
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **2 Claims**



1. In an improved apparatus for heating a liquid supply by collecting heat from the sun's rays, in combination:

a. an angle mounted flat heat exchange unit having an upper end and a lower end, and a liquid intake at its upper end and a liquid outlet at its lower end, said heat exchange unit having a liquid-tight compartment associated therewith, said liquid-tight compartment comprising a fixed upper plate and a fixed bottom plate, said bottom plate being spaced outwardly from the upper plate, lateral baffles within the area between the top and bottom plates forming channels to guide a liquid laterally from side to side of the heat exchange liquid-tight compartment throughout the area of the liquid-tight compartment from its intake end to its outlet end;

b. a tank for storing the said liquid supply and means for connecting the liquid supply tank with the liquid-tight compartment through fixed conduits connected to said tank including means for pivotally connecting said conduits to the liquid-tight compartment of the heat exchange unit;

c. means for circulating the liquid in the liquid supply tank and the liquid-tight compartment of the heat exchange unit for heating said liquid;

d. said heating apparatus comprising a plurality of individual universally adjustable lenses mounted upon a lens-supporting plate, said plate being mounted above the upper plate of the heat exchanger unit at a distance to focus the sun's rays through the said lenses on the upper plate of the heat exchange unit, said lenses being formed in groups, wherein each group of lenses is adjusted to concentrate the sun'rays at different time periods as the angle of the sun's rays change relative to the upper surface of the upper plate of heat exchange unit;

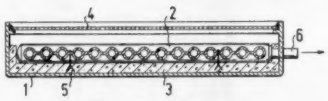
e. supporting means for each of said lenses comprising, a first supporting means fixed to said lenses and diametrically attached thereto, a second lens-supporting member diametrically attached to the lens-supporting plate at 90° from the attachment of the first lens-supporting member to the second lens-support and means for securing each of the first and second lens-supporting members in adjusted position.

4,066,063

DEVICE FOR THE TRANSMISSION OF SOLAR ENERGY TO A LIQUID MEDIUM

Erwin Gross, Burgsolms, and Hans Vowinkel, Florsheim (Main), both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 23, 1976, Ser. No. 698,841
Claims priority, application Germany, June 25, 1975, 2528267
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **6 Claims**

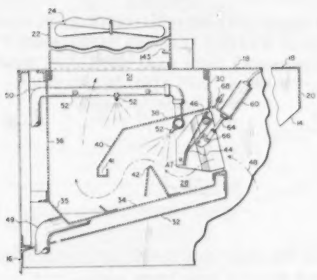


1. A device for the transmission of solar energy to a liquid medium including a flat-bottomed box having an open top, a light-permeable cover closing said top and a heat exchanger positioned within said box below said cover, said heat exchanger comprising a relatively flat platelike blow molded element having a pair of generally parallely extending spaced collecting channels formed therein and a plurality of liquid flow connecting channels integrally formed and in communication with said collecting channels, said platelike element being blow molded from an extruded tubular preform made of black pigmented polypropylene and said connecting channels having a diameter of from 5 to 25 mm, a wall thickness of from 1 to 3 mm and being spaced from each other a distance of from 2 to 30 mm.

4,066,064
KITCHEN VENTILATOR DAMPER ACTUATOR AND CONTROL

Edward B. Vandas, St. Louis, Mo., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Apr. 8, 1976, Ser. No. 674,816
Int. Cl.[2] F23L *13/00*
U.S. Cl. 126—299 E 14 Claims

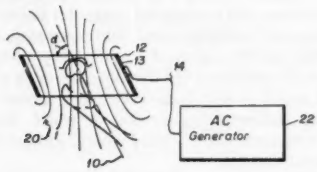


1. In a kitchen venting system having an exhaust duct and power fan means therein, and structure defining a passage between the kitchen and the exhaust duct whereby kitchen fumes are vented through the passage upon operation of the fan means, the improvement comprising the combination of a damper, means supporting the damper to shift between a closed position blocking the passage and an opened position allowing flow through the passage, a fluid power actuator having first and second members that move relative to one another upon the extension and retraction of the power actuator, means securing the first and second members of the power actuator between said structure and damper to provide that extension and retraction of the power acutuator respectively shifts the damper between and to said positions, a source of fluid under pressure, a control valve between said source and the power actuator operable to pressurize and exhaust the latter to control the extension and retraction thereof, said control valve being four-way having two operative positions that respectively interconnect two pairs of ports each consisting of an infeed port and an outfeed port, and one pair of infeed and outfeed ports being connected to opposite operative sides of the power actuator and the opposite pair of infeed and outfeed ports being connected to the source of fluid and to a drain, operable to have powered operation for both the extension and retraction of the power actuator and the resulting shifting of the damper.

4,066,065
COIL STRUCTURE FOR ELECTROMAGNETIC THERAPY

Werner Kraus, Kaulbachstrasse 71, 8000 Munich 22, Germany

Filed May 24, 1976, Ser. No. 689,376
Int. Cl.[2] A61N *1/42*
U.S. Cl. 128—1.5 8 Claims

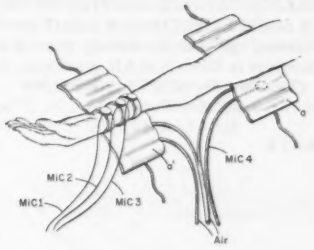


1. Coil structure for electromagnetic therapy comprising at least one layer of electrically conductive windings (12) and terminal means (14) connected to the windings to connect the windings to a source (22) of alternating current, said windings enclosing an open space for treatment of a portion of the body of a patient by generating a low-frequency electromagnetic field upon connection of the windings to said source (22), wherein said windings are shaped to form an elliptical cylinder the end faces of said cylinder being inclined with respect to the central axis of said cylinder, such that the space enclosed thereby is oval, or essentially elliptical in cross section.

4,066,066
ELECTRONIC PULSE FEELING DEVICE FOR PRACTICE OF DIAGNOSIS IN ORIENTAL MEDICINE

Hee Soo Paek, 8-29 2ga, Myunyoondong, Chongrogu, Seoul, South Korea

Filed Oct. 30, 1975, Ser. No. 627,356
Claims priority, application South Korea, July 1, 1975, 1453
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—2.05 P 1 Claim



1. Pulse feeling apparatus for use in aiding a medical practitioner in making a diagnosis in the practice of oriental medicine, comprising in combination:

four microphone means each producing electrical signals corresponding to human vascular pulses;

means for restricting blood flow and for positioning a first of said microphone means inside the arm at the elbow whereby said first of said microphone means produces a first electrical signal representing the frequency of the vascular pulse at the location of said restricted blood flow,

means for positioning a second, third, and fourth of said microphone means on the arm at three preselected locations,

amplifier means connected to receive said electrical signals from said microphone means for producing amplified signals therefrom,

graphical representation means connected to be driven by said amplified signals from said amplifier means corresponding to said second, third, and fourth microphone means electrical signals, and

count display means connected to be driven by said amplified signal from said amplifier means corresponding to the signal produced by said first microphone means representing the pulse rate whereby the pulse rate is communicated to said medical practitioner.

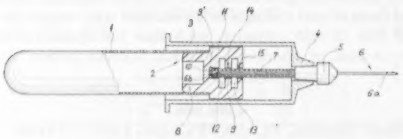
4,066,067
VIAL STOPPER FOR BLOOD SAMPLING DEVICE

Antoine Micheli, Landecy, Switzerland, assignor to DEMATEX Development & Investment Establishment, Liechtenstein

Filed Mar. 19, 1976, Ser. No. 668,795
Claims priority, application Switzerland, Mar. 21, 1975, 3634/75
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—2 F 20 Claims

1. A generally cylindrical stopper for a vial comprising, a hollow body of deformable material having a peripheral wall and insertable into the neck of a vial, a closed inner end wall defining a thin sealing diaphragm to obturate the vial, and a

flexible outer end wall defining at least one flexible lip delimiting at least one slot, said at least one lip extending radially inwardly from said peripheral wall and defining a central



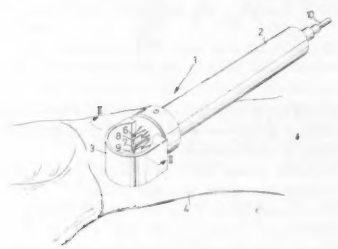
opening of relatively small cross-sectional area leading into a chamber of larger cross-sectional area and defined by said end and peripheral walls.

4,066,068

METHOD AND APPARATUS FOR DETERMINING THE AMOUNT OF A SUBSTANCE EMITTED BY DIFFUSION FROM A SURFACE SUCH AS A DERM SURFACE

Gert Erik Nilsson, and Åke Per Öberg, both of Linkoping, Sweden, assignors to Servo Med AB, Stockholm, Sweden

Filed Nov. 26, 1975, Ser. No. 635,348
Claims priority, application Sweden, Nov. 28, 1974, 7414916
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—2 R **10 Claims**



1. A method at the determination of the amount of a substance emitted by diffusion from a surface, comprising the steps of creating a substantially stable diffusion zone with a measuring area by protecting at least the immediate surroundings of the entire surface or a part thereof against outer passing gas streams, sensing the temperature and the relation between the absolute partial vapor pressure and the saturation pressure at the temperature in question substantially simultaneously each in at least two points within the measuring area at different distances from the surface, determining the absolute partial vapor pressure in at least two points within the measuring area at different distances from the surface with the help of the results of said sensing, and estimating the partial pressure gradient in the diffusion zone with the help of said partial pressure.

4,066,069

HEART RATE CHANGE SENSOR

Volker Dolch, Salzburger Str. 53, Offenbach, Germany (6050)

Filed May 18, 1976, Ser. No. 687,534
Int. Cl.[2] A61B *5/04*
U.S. Cl. 128—2.06 F **24 Claims**

1. In combination for detecting changes in the heart beat of a patient,

first means for prerecording and recirculating a heart beat of the patient,

second means for detecting each heart beat of the patient and producing signals representing such heart beat,

third means responsive to the signals from the first and second means for producing signals having characteristics representing any differences between the rates of the heart beats from the first and second means,

fourth means responsive to the signals from the third means for adjusting the rate of recirculation of the heart beat in the first means in accordance with the characteristics of the signals from the third means,

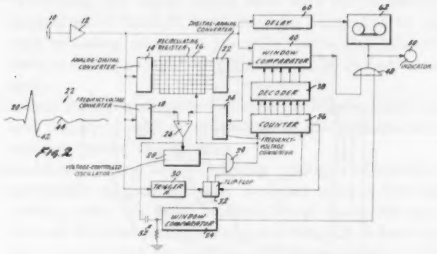


Fig. 2

fifth means for comparing the characteristics of the recirculated and detected heart beats, and

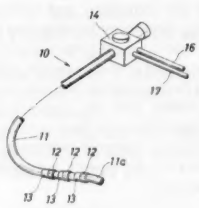
sixth means responsive to the signals from the fifth means for providing an indication when the detected heart beat has characteristics different from those of the recirculated heart beat.

4,066,070

TUBULAR MEDICAL INSTRUMENT HAVING A FLEXIBLE SHEATH WITH CUFFS

Mikio Utsugi, Machida, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed June 30, 1976, Ser. No. 701,075
Claims priority, application Japan, June 30, 1975, 50-91455[U]
Int. Cl.[2] A61B *1/00*
U.S. Cl. 128—4 **5 Claims**



1. A tubular medical instrument comprising:

an elongated flexible sheath for insertion into a body cavity of a human body;

a radially expansible main cuff having a doubled back section on an outer peripheral surface of one end of the flexible sheath and also having outer surfaces which, when said sheath is inserted in the body cavity, are normally in contact with a wall surface of the body cavity when the main cuff is expanded, means for supplying air to said main cuff to expand same, said outer surfaces, when said main cuff is expanded in said body cavity, being continuously deformed in a first direction upon movement of said sheath in said body cavity in a second opposite direction corresponding to that in which the flexible sheath is inserted into the body cavity, without involving substantial slippage;

a radially expansible auxiliary cuff mounted on a portion of the outer peripheral surface of the flexible sheath which is close to the main cuff and is opposite to said one end of the flexible sheath with respect to the main cuff;

said doubled back section riding on the auxiliary cuff as the

main cuff is being deformed in the first direction during the insertion of the flexible sheath; and

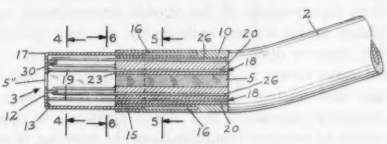
means for supplying air to said auxiliary cuff to expand same to separate the outer surfaces of the main cuff from the wall surface of the body cavity and to push the doubled back section away from the auxiliary cuff into an original position of the doubled back section with respect to the main cuff.

4,066,071

EXTENSION PULL THROUGH DEVICE TO ALLOW FOR EASIER PASSAGE OF FLEXIBLE FIBER ENDOSCOPE

John G. Nagel, 200 Closter Dock Road, Closter, N.J. 07624

Filed Aug. 15, 1975, Ser. No. 604,999
Int. Cl.[2] A61B *1/06*
U.S. Cl. 128—7 **33 Claims**



1. An endoscope having a distal end and a proximal end for viewing remote areas by transferring an image from the distal end where the object for viewing is located to the proximal end where the image transferred can be viewed by an operator comprising:

1. a flexible fiber optical bundle comprised of light conducting fibers,
2. at least a portion of the fiber optical bundle being arranged at the distal end to define an optical face for receiving an image and transferring that image to the proximal end of the endoscope,
3. means at the proximal end of the endoscope for viewing the image transferred from the face of the distal end, and

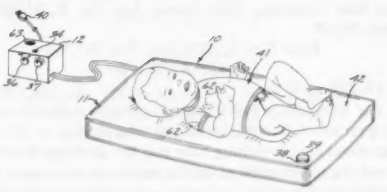
moving means at said distal end operable from the proximal end for tractively advancing the endoscope progressively into a passage, said moving means including a small rigid portion fixedly attached at the distal end, a movable pilot section which is slidably engaged with the rigid portion of the distal end, and said moving means further includes means for moving the pilot section relative to the rigid portion and alternately moving the rigid portion relative to the pilot section such that the distal end of the endoscope can be tractively advanced into a passage.

4,066,072

COMFORT CUSHION FOR INFANTS

Betty L. Cummins, Ocean Vista No. 202, 1803 E. Ocean Blvd., Long Beach, Calif. 90802

Filed Feb. 12, 1976, Ser. No. 657,580
Int. Cl.[2] A61H *1/00*
U.S. Cl. 128—40 **24 Claims**



1. A comfort cushion for infants comprising in combination:

a fluid filled flexible elastic hermetically sealed infant supporting, elongated mattress filled with a substantially non-compressible fluid, said mattress having a fluid inlet conduit and a fluid outlet conduit sealably attached to and opening into the mattress, said inlet conduit having a pressure actuated valve means within a fluid containing chamber of the mattress for permitting said fluid to flow into the chamber only at a pre-selected fluid pressure, said mattress having a removable fill plug therein for filling and emptying said mattress with said non-compressible fluid; and

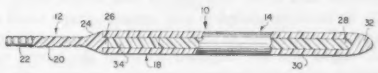
a fluid pulsating pump means having a fluid exhaust conduit sealably connected to the said inlet conduit and a fluid intake conduit sealably connected to said outlet conduit, said pump and valve means for pulsatingly circulating said fluid into and out of said mattress in a manner simulating the sounds and movements a pre-born infant is subjected to.

4,066,073

COMPOSITE ROD PENILE IMPLANT

Roy P. Finney, Tampa, Fla., and Henry Wilfred Lynch, Racine, Wis., assignors to Medical Engineering Corporation, Racine, Wis.

Filed Oct. 4, 1976, Ser. No. 729,251
Int. Cl.[2] A61F *5/00*
U.S. Cl. 128—79 **23 Claims**



1. An elongated, rod-like, penile implant comprising, in a generally axial orientation:

a relatively stiff proximal portion receivable in the crus of the corpus cavernosum for supporting the implant;

a relatively stiff distal portion suitable for positioning, in the corpus cavernosum of the pendulus penis; and

a relatively flexible hinge portion intermediate said proximal and distal portions.

4,066,074

PROTECTIVE GUARD AND METHOD FOR FORMING AND APPLYING

Martin Keller, 13880 Wide Acre Road, Golden, Colo. 80401

Filed Sept. 27, 1976, Ser. No. 726,609
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—89 R **8 Claims**

4. As an article of manufacture, a guard particularly suited for protecting the shinbone area of the leg comprising a thin flat rigid plate of thermoplastic material having the property of becoming moldable when heated and on cooling becoming rigid again and retaining the shape in which it cools, an elongated strip of strong highly flexible material securely attached to said plate in face engagement with one side thereof, said strip having a width about the same as that of said plate transverse to the strip and having a length sufficient to extend beyond both ends of said plate a distance sufficient for substantial overlapping the ends thereof when the strip is wrapped about a leg with said plate conforming to the shinbone area, and means for utilizing said strip to attach said plate in position over the selected area.

4,066,075

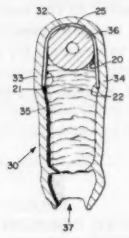
U-SHAPE INTRAVAGINAL DEVICE

Amy Gray Hughes, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 578,297, May 16, 1975, abandoned. This application June 30, 1976, Ser. No. 701,056

Int. Cl.[2] A61F *5/46*

U.S. Cl. 128—127 **8 Claims**



1. A U-shape intravaginal device for use in female mammals in which an arcuate-shape vault is defined intermediate the posterior wall of the vagina and the adjacent portion of the cervix uteri of the female, said device comprising two arms and an arcuate-shape heel, said arms and said heel being secured together in end-to-end relation with said heel portion disposed intermediate said arms, said heel of said device being configured to be accommodated in said arcuate-shape vault so that said arms of said device extend generally towards the introitus of said vagina and are disposed adjacent the lateral walls of said vagina, said heel further comprising an upwardly extending arcuate-shape rim, and a radially inwardly extending arcuate-shape support portion, said rim being sized and configured to fit a user's posterior formix, and said support portion being configured and adapted to mechanically support a posterior portion of the user's cervix uteri.

4,066,076

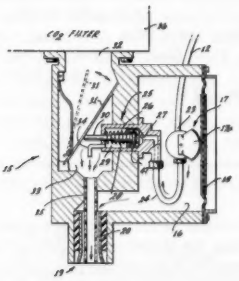
REBREATHABLE GAS MIXING AND CONTROL DEVICE

Larry H. Williamson, 18232 Santa Sophia, Fountain Valley, Calif. 92708

Filed Sept. 10, 1976, Ser. No. 721,966

Int. Cl.[2] A62B *7/00*

U.S. Cl. 128—142.2 **9 Claims**



1. In a breathable gas life support system of the type having a supply of breathable gas stored at high pressure with apparatus for treating exhaled gas capable of being rebreathed including breathing circuit means for recirculating a portion of exhaled gas from a breathing connection means, through a reservior for storage of the exhaled gas through a CO_2 filter, and return to the user, an improved device for regulating, mixing and provision of stored and treated rebreathable gas comprising:

housing means having a mixing chamber connected to said breathing circuit means between said CO_2 filter and said breathing connection means for treating exhaled gas whereby the breathable portion of the exhaled gas freely flows into said mixing chamber;

first valve means disposed between said mixing chamber and said breathing circuit means for treating exhaled gas with said first valve means maintained in a normally closed condition thereby preventing the breathable portion of the exhaled gas from entering the mixing chamber;

a second chamber in said housing means closed to the outside environment with diaphram means for accomplishing such closure;

second valve means connected to said high pressure breathable gas supply, normally maintained in a closed condition with the operative portion of said second valve means operatively connected to said diaphram means whereby, upon the gas pressure in said second chamber being less than the pressure of the outside environment, said diaphram means will move inwardly, into said second chamber, thereby opening said second valve means;

third valve means interconnecting said second valve means and said mixing chamber with said third valve means normally maintained in a closed position and opened by means of pressure resulting from the opening of said second valve means;

said third valve means operatively connected to said first valve means, whereby upon the opening of said second valve means, said third valve means is opened, thereby providing a free flow condition between the apparatus for treating exhaled gas and said mixing chamber;

breathing conduit means directly communicating with said mixing chamber with one end thereof terminating in said breathing connection means adapted to be maintained in connection with the respiratory system of the user;

high velocity jet means connected to said third valve means and directed into said mixing chamber and breathing conduit means, whereby, upon the opening of said third valve means, gas from said high pressure supply will exit said jet means and flow into and through said mixing chamber and said conduit means, thereby creating a reduced pressure condition in said mixing chamber resulting in the drawing of previously exhaled gas from the storage reservoir through said CO_2 filter and said breathing circuit means for treating exhaled gas and into said mixing chamber wherein it is mixed with gas exiting said jet means and drawn through said breathing conduit means;

and intake means for coupling said second chamber with the respiratory system of the user's inhaling through said intake means, pressure in said second chamber is reduced whereby said diaphram means moves inwardly opening said second valve means.

4,066,077

MOUTHPIECE RETAINER TABS

Ralph Barr Shamlian, 3549 Haven Ave. No. E, Menlo Park, Calif. 94025

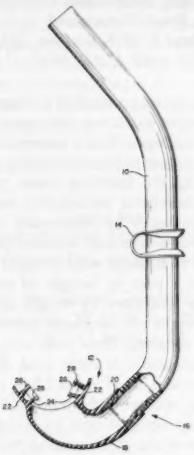
Filed Nov. 1, 1976, Ser. No. 737,788

Int. Cl.[2] A62B *7/00*

U.S. Cl. 128—145 A **6 Claims**

1. For use with a breathing apparatus, a mouthpiece comprising means defining a breathing tube having an end, flange means about said breathing tube end for insertion between the lips and the outer surfaces of the teeth of a user and a pair of teeth engageable collapsible tab means for insertion between essentially the molars of the user, said tab means being mounted on said flange means on either side of said breathing tube end, each of said tab means including means defining a central bore therein whereby upon engagement of said tab means by the teeth of a user, said tab means readily collapses

and flattens to an approximate dental impression of the user, said each tab means being constructed of material having



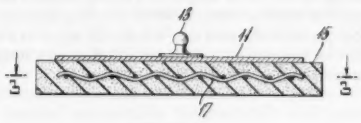
sufficient elastic memory to return to a substantially undeformed configuration after use.

4,066,078

DISPOSABLE ELECTRODE

Jeffrey Berg, Edison, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Feb. 5, 1976, Ser. No. 655,600
Int. Cl.[2] A61B *5/04*
U.S. Cl. 128—2.06 E **15 Claims**



1. An electrode providing electrical contact with a patient's skin comprising:

a conductive member including means for connection to an external electrical apparatus; and

means for electrically interfacing to said patient's skin being electrically and mechanically connected to said conductive member, said interfacing means being a non-liquid film which is easily separable from the skin upon removal without any noticeable residue and which consists essentially of an electrically conductive organic polymer plasticized with a polyhydric alcohol with said organic polymer being derived from an ester of an α,β-olefinically unsaturated carboxylic acid and a monohydric or polyhydric alcohol having a terminal quaternary ammonium group.

4,066,079

FILTER NEEDLE

Victor D. Chiarolla, 112 Evergreen St., Mill Valley, Calif. 94941

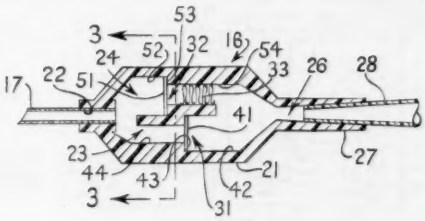
Filed Nov. 3, 1976, Ser. No. 738,616
Int. Cl.[2] A61M *5/32*
U.S. Cl. 128—218 N **5 Claims**

1. An improved filter device for an injection syringe which has a plunger disposed in a barrel for drawing a fluid into the barrel through a front opening and ejecting such fluid therefrom by plunger movement comprising:

a housing having a syringe receiving rear opening at the rear thereof for engagement with a syringe about the front opening thereof and a needle receiving aperture at the front thereof for engaging a hypodermic needle in extension therefrom,

said housing defining first and second separate passages extending between said rear opening and front aperture thereof,

a first one-way valve disposed in said first passage for admitting the flow of fluid therethrough only from said aperture to said opening,



a second one-way valve disposed in said second passage for admitting the flow of fluid therethrough only from said opening to said aperture, and

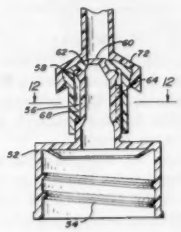
filter material disposed in one of said passages on the inlet side of the valve therein.

4,066,080

DISPOSABLE SYRINGES

Vincent R. Sneider, 3422 Hallcrest Drive, Hampton Hall, Atlanta, Ga. 30319

Division of Ser. No. 592,037, June 30, 1975, Pat. No. 4,014,332, which is a continuation-in-part of Ser. No. 389,506, Aug. 20, 1973, abandoned. This application Sept. 20, 1976, Ser. No. 724,724
Int. Cl.[2] A61M *7/02*
U.S. Cl. 128—251 **2 Claims**



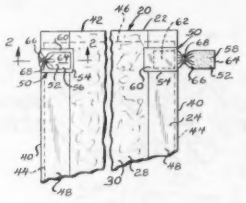
1. A syringe for vaginal douche and enemas and the like, said syringe including: (a) a flexible container; (b) a discharge tube connected to the container in a fluid-tight manner; (c) at least one of the component portions of a fluid mix to be used with said syringe contained in this flexible container; (d) a manipulative cutoff valve associated with said discharge tube, said valve when open permitting the flow of fluid from the container, said valve including a longitudinally movable outer sleeve member carried by and on an inner tubular member having means for attaching to the container, said inner tubular member having outwardly extending inner and outer limiting shoulders formed thereon, the inner tubular member also having its distal end closed except for a small aperture therethrough, the movable outer sleeve having an inwardly extending collar which is slidable along the inner tubular member and between the inner and outer limiting shoulders of the inner member, said outer sleeve member having a sealing surface formed thereon and adapted to close the discharge aperture at one limit of movement and open the aperture at the other limit of movement, and (e) a discharge nozzle attachable to the outlet end of the discharge tube.

4,066,081

DIAPER WITH EXTENSIBLE FASTENER

Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 18, 1976, Ser. No. 742,973
Int. Cl.[2] A41B 13/02; A61F 13/16
U.S. Cl. 128—287 4 Claims



1. A disposable diaper, comprising:

an absorbent pad assembly having opposed surfaces and a side edge; and

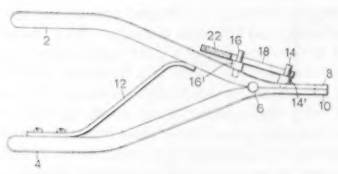
a tape fastener, comprising a pressure-sensitive tape strip having a first end portion secured to one of said surfaces of the pad assembly adjacent the side edge, a second securement end portion for securing the diaper about an infant, a means for providing a stress extensible diaper fastening means comprising an elastic band extending around and laterally constraining a central portion of the strip intermediate said first and second portions, with said band being of a size to constrict and reduce the lateral dimensions of said central portion and thus the effective normal length of said strip, and with said second strip portion being longitudinally extensible relative the first portion by increasing the size of said central portion from reduced to enlarged lateral dimensions while expanding said band responsive to forces applied in a longitudinal direction against said strip.

4,066,082

FORCE APPLICATOR INCLUDING INDICATOR

Mircea Arcan, Ramat Hasharon; Gordon Robin, and Ariel Simkin, both of Jerusalem, all of Israel, assignors to Ramot University Authority for Applied Research and Industrial Development Ltd., Tel Aviv, Israel

Filed Apr. 20, 1976, Ser. No. 678,609
Claims priority, application Israel, Apr. 24, 1975, 47164
Int. Cl.[2] A61B 17/00; G01B 5/30, 11/18
U.S. Cl. 128—303 R 6 Claims



1. A device for indicating the force applied by a tool to an object, comprising: a bar constituting a part of said tool so as to be deflected in accordance with the force applied thereby to the object; a pair of spaced stops carried by the bar; a frame enclosing both stops with one end of the frame engaging one side of one stop and the opposite end of the frame extending past the other stop to define a space between said other stop and said opposite end of the frame; and a load-sensing member disposed in said latter space, whereby the deflection of said bar is converted by the two stops and the frame to a compressive force on the load-sensing member.

4,066,083

STERILE SURGICAL COLLAGEN PRODUCT

Peter E. Ries, Reinach, Basel-Land, Switzerland, assignor to Pentapharm A.G., Basel, Switzerland

Filed June 3, 1976, Ser. No. 692,542
Int. Cl.[2] A61F 13/00; A61L 15/04
U.S. Cl. 128—325 2 Claims

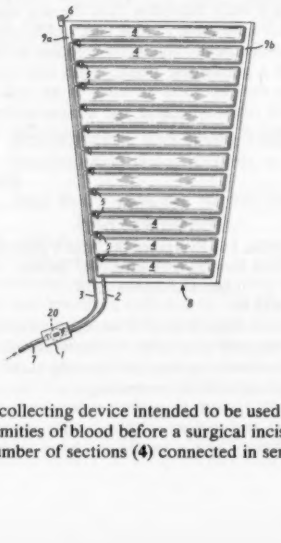
1. A method for preparing a surgical collagen product which has a felt- or fleece-like structure with open, communicating voids between the collagen fibers, comprising comminuting collagen-containing tissues of pigs at a temperature not exceeding 40° C, degreasing the resulting tissue pulp and simultaneously removing therefrom undesirable water-soluble non-collagen ballast substances by repeatedly treating the said tissue pulp with about a five-fold volume, based on the pulp volume, of a 5 to 15% aqueous sodium chloride solution containing about 0.2 to 1 part by weight of sodium azide as a preserving agent per 1000 parts by weight of the said solution and 0.5 to 2% by weight of a non-ionic fat-dispersing wetting agent, washing the resulting fiber pulp with water or 0.1 to 0.5% aqueous formic, acetic or citric acid, digesting the fiber pulp for 8 to 48 hours at a pH of about 2.5 to 3.5 in the five-fold volume, based on the volume of the pulp, of 0.1 to 5% aqueous acetic acid containing about 1 part by weight of pepsin per 1000 parts by weight of the tissue used as the starting material in order to remove non-collagen type proteinaceous substances and telopeptides, precipitating collagen from the resulting collagen suspension by the addition thereto of aqueous sodium chloride in such a quantity that the sodium chloride concentration of the suspension is about 3 to 5%, separating the precipitated collagen and desalting it by ultrafiltration, dialysis or washing with 60 to 75% aqueous ethyl alcohol until the salt content of the collagen is reduced to 0 to about 0.9% by weight, calculated on the weight of the dry collagen, dissolving the desalted collagen in demineralized or distilled water containing up to 3% by weight of a strong organic acid in such a proportion that the concentration of collagen in the resulting solution corresponds to a dry residue of about 0.5 to 2% by weight, freeze-drying the collagen solution, and sterilizing the freeze-dried collagen product.

4,066,084

BLOOD EMPTYING DEVICE

Hans Tillander, Humlegardsgatan 3, S-412 74 Goteborg, Sweden

Continuation-in-part of Ser. No. 540,431, Jan. 13, 1975, abandoned. This application May 24, 1976, Ser. No. 689,347
Claims priority, application Sweden, Jan. 14, 1974, 7400412
Int. Cl.[2] A61B 17/12
U.S. Cl. 128—327 6 Claims



1. Blood collecting device intended to be used in the emptying of extremities of blood before a surgical incision and comprising a number of sections (4) connected in series to receive

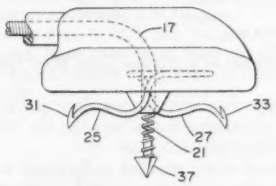
and retain a gaseous medium, a number of valves (5) connecting said sections in said series comprising pressure-responsive means for allowing a gaseous medium to pass from one section to another only when a predetermined gas pressure has been obtained in a next preceding section and retaining the predetermined pressure in each filled section as the other sections are filled, a filling tube (2) connecting a first section of the device to an operating device (1), and the operating device which in one position is arranged to allow the gaseous medium to pass to the valves (5) and into the sections (4) and in a second position is arranged to open the valves (5) for emptying the sections.

4,066,085

CONTACT DEVICE FOR MUSCLE STIMULATION

Stanley R. Hess, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Continuation of Ser. No. 540,805, Jan. 14, 1975, abandoned. This application May 20, 1976, Ser. No. 688,238
Int. Cl.[2] A61N *1/04*
U.S. Cl. 128—418 **2 Claims**



1. A pacemaker lead for application to cardiac muscle from outside the heart to effect stimulation, comprising

a generally flat disk of electrical insulating material,

a plurality of arcuate barbed hooks embedded in said disk and protruding therefrom at one surface of said disk,

a relatively flexible coil of conductive wire extending perpendicularly from said disk from the same surface thereof and disposed substantially concentrically with respect to said hooks,

said coil being electrically insulated from said hooks by the material of said disk,

and a flexible insulated electrical lead-in wire connected to said coil and secured to said disk,

the wire and the coil being connected within said disk,

said lead-in wire extending outwardly from said disk to allow its connection to a source of current,

whereby said coil may be inserted in cardiac muscle to establish an electrical connection to a pacemaker unit and said hooks serve to anchor said coil and disk to the cardiac muscle, said coil riding in non-binding relationship to said muscle.

4,066,086

PROGRAMMABLE BODY STIMULATOR

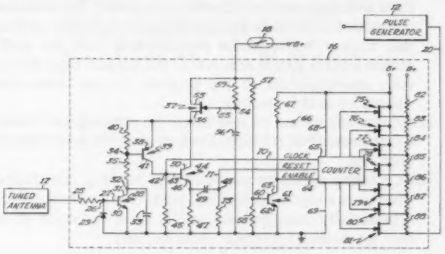
Clifton A. Alferness, Woodinville, Wash., and John M. Adams, Anoka, Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 584,131, June 5, 1975, abandoned. This application Sept. 13, 1976, Ser. No. 722,626
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—421 **29 Claims**

1. In a body-implantable device for providing electrical stimulation to living animal tissue of the type having pulse generator means with at least one alterable output parameter, output means adapted for connection to said tissue and means responsive to externally generated signals for programming said alterable output parameter in predetermined correspondence with said signals, the improvement wherein said programming means comprises:

means for detecting first externally generated signals of predetermined characteristics;

means responsive to detected first signals for altering said alterable output parameter in predetermined correspondence with said first signals;



means for detecting second externally generated signals of predetermined characteristics discriminable from the characteristics of said first signals; and

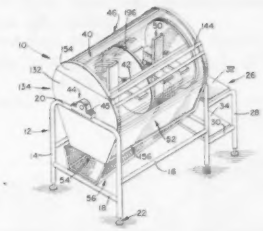
means responsive to detected second signals for enabling said output parameter altering means only during the occurrence of said second signals.

4,066,087

PEA SHELLING APPARATUS

Rolza J. Rodgers, Centerville, Ga., assignor to Ross Agricultural Company, Inc., Tuscaloosa, Ala.

Filed Dec. 22, 1975, Ser. No. 642,745
Int. Cl.[2] B02B *3/08*
U.S. Cl. 130—30 H **14 Claims**



1. An apparatus for shelling peas, beans, leguminous vegetables and the like and delivering same in a substantially undamaged condition comprising:

a frame;

a drum rotatably mounted on said frame for receiving peas, beans, leguminous vegetables and the like to be shelled, said drum being cylindrical with a smooth, continuous inner surface which contacts the product being shelled, said drum being mounted to have the longitudinal centerline thereof essentially horizontal;

a shaft mounted on said frame and extending axially through said cylindrical drum along said longitudinal centerline for supporting same;

a plurality of elongate paddles with a substantially equal width throughout, said paddles each being mounted on said shaft for rotation therewith and located in said cylinder to extend radially outward of said shaft from a central mounting portion of said paddles to outer tips on each end of each paddle, said paddle outer tips being located a sufficient distance from said drum inner surface to permit shelled product to pass freely therebetween, each paddle having a flat surface oriented parallel to said longitudinal centerline for substantially the entire length of said paddle from said shaft to the outer tips of said paddle to present

a flat striking surface for substantially the entire length thereof from outer tip to outer tip for impacting the peas, beans and the like, said flat striking surfaces of all of said paddles thereby being oriented generally perpendicularly with respect to a tangent to said drum inner surface so that as said drum and paddles are rotated, product is moved from said inner surface toward said paddle flat surfaces in a direction essentially perpendicular to said flat surface so that impact between the product and said flat surface effects a quick gentle removal of the kernels from the hulls with essentially all of the product in said drum being shelled by said impacting;

drum rotating means on said frame for rotating said drum at a first prescribed rotational velocity which is substantially constant;

shaft rotating means on said frame for rotating said shaft and paddles at a second prescribed rotational velocity which is substantially constant and in the same direction as said first prescribed rotational velocity; and

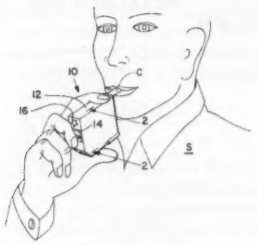
means for maintaining said first and second rotational velocities within a predetermined range of said prescribed rotational velocities with said predetermined range being small enough to prevent said kernels from being pulverized, bruised or mutilated on impacting said flat striking surfaces.

4,066,088

SMOKE REDUCER FOR CIGARETTE SMOKERS

John E. Ensor, 1409 Mount Carmel Road, Parkton, Md. 21120

Filed Aug. 26, 1976, Ser. No. 717,919
Int. Cl.[2] A24F *3/00, 47/00*
U.S. Cl. 131—185 **11 Claims**



1. A smoke reducer for smokers of cigarettes and the like, comprising: means on the smoke reducer for holding said a cigarette, including a housing with an opening for receiving said a cigarette with a first end of said a cigarette extended for permitting drawing smoke therefrom, the housing having an air vent therein for cigarette ignition and otherwise being substantially air tight; means on said smoke reducer, including a control having a switch portion, positionable to a first location for concurrently admitting air to and turning on heat for igniting a second end of said a cigarette, and positionable to a second location for extinguishing said a cigarette by turning off said igniting heat and closing said air vent.

4,066,089

COLLAPSIBLE SHELTER STRUCTURE

Orman M. Rainwater, 947½ N. Wilcox Ave., Hollywood, Calif. 90038

Filed May 17, 1976, Ser. No. 686,887
Int. Cl.[2] A45F *1/16*
U.S. Cl. 135—3 E **4 Claims**

1. In a collapsible shelter structure:

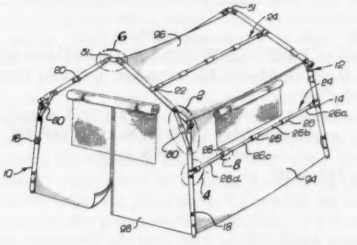
a. a front frame section;

b. a rear frame section;

c. each of said sections comprising a series of four frame elements pivotally and non-detachably connected together to be folded one along the other and to be extended into frame configuration with the end elements forming standards at the corners of the shelter structure and the intermediate elements forming rafters;

d. a series of substantially horizontal braces, one for each of two corresponding frame elements of the front and rear frame sections respectively, each brace being connected at opposite ends respectively substantially centrally of the respective frame elements;

e. said rafters of each frame section being pivotally connected together at a floating ridge point free of a ridge pole;



f. means supporting said floating ridge points in elevated position, comprising braces between the rafters and the corresponding standards; and

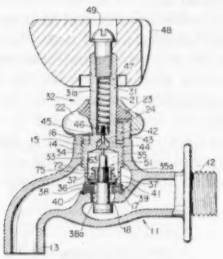
g. flexible panel means attached to the frame sections inside the braces whereby the braces are accessible for manipulation for movement of the shelter from an intermediate collapsed position with the ridge points lowered to an extended position with the ridge points raised.

4,066,090

WATER COCK WITH NON-FREEZING VALVE

Kiminori Nakajima, Fujisawa, and Ikuo Shigenobu, Machida, both of Japan, assignors to Echo Co., Ltd., Machida, Japan

Filed Mar. 26, 1976, Ser. No. 670,694
Int. Cl.[2] F16K *17/00*
U.S. Cl. 137—62 **8 Claims**



1. In a water cock having a cock body provided with a cylindrical portion, a water outlet and a water inlet, a tubular member provided with a handle and engaged with a threaded portion formed in said cylindrical portion, a partition wall separating the inner space of the cock body into two compartments, one in communication with the inlet and the other in communication with the outlet, a primary valve opening formed in the partition wall so as to be placed under the lower end of the tubular member in order to allow communication between the chambers, a cap through which said tubular member is passed and which seals the cylindrical portion by a packing system contained within the cap contacting firmly with the tubular member; the improvement comprising a cavity portion formed at the lower end of the tubular member, a

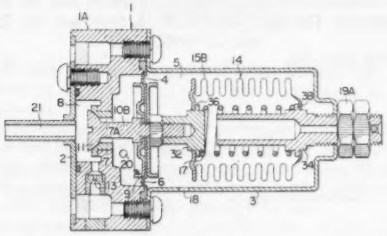
ring-shaped main packing positioned on a circular lower edge of the cavity portion so as to be concentric with the circular lower edge in order to close said primary valve opening as a result of a turning of said handle, said cavity portion having at least one through-hole formed in its depending wall for the flow of cold water therethrough to the outlet, a thermo-element containing heat-sensitive material the volume of which changes in response to change in water temperature, a shaft partially contained in said thermo-element and adapted to be slid in and out of said thermo-element in response to said volume change, and a valve mechanism for opening and closing a central opening of said main packing in response to the action of said thermo-element, whereby water is permitted to flow through said central opening and subsequently through said through-hole to said outlet in response to a temperature change of said heat-sensitive material, said thermo-element and said valve mechanism being at least partially contained within the cavity portion.

4,066,091

PRESSURE SWITCHING VALVE DEVICE

Tomo Itoh, Katsuta, and Syozo Yanagisawa, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 3, 1975, Ser. No. 609,937
Claims priority, application Japan, Sept. 11, 1974, 49-103879
Int. Cl.[2] F02M *7/20;* F16K *31/365*
U.S. Cl. 137—79 **12 Claims**



1. A pressure switching valve device comprising:
a valve seat having defined therein an orifice;
a valve member for normally opening and closing said orifice;
a diaphragm integrally connected to said valve member, said diaphragm being operative in response to pressure thereon to move said valve member for opening said orifice; and
an atmospheric density compensating mechanism cooperatively connected to said valve member and operative in response to variation in atmospheric density for compensating for the opening and closing movements of said valve member, said atmospheric density compensating mechanism normally exerting a force on said valve member so that the valve member closes said orifice, said force decreasing with the lowering of the atmospheric density.

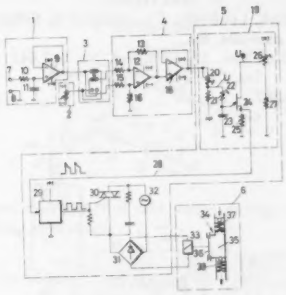
4,066,092

APPARATUS TO REGULATE THE pH VALUE OR OTHER SIMILAR VALUES OF A SOLUTION

Viktor Dulger, Ludolf-Krehl-Strasse 8, and Franz Ernst, Langgarten 24a, both of Heidelberg, Germany (6900)

Filed Dec. 27, 1976, Ser. No. 754,178
Claims priority, application Germany, Sept. 13, 1976, 2641101
Int. Cl.[2] G05D *11/08*
U.S. Cl. 137—93 **7 Claims**

1. Apparatus to regulate the pH value or other similar values of a solution comprising, an actual value transmitter, a desired value transmitter, a regulator controlled by said two transmitters for generating an error signal, pulse generator driven by said regulator for generating a control signal, a servo unit for adding controlled quantities of additive to said solution, said servo unit containing a metering pump for adding an additive, said pump being driven by pulses from said pulse generator, and the pulse frequency of said pulse generator bearing a



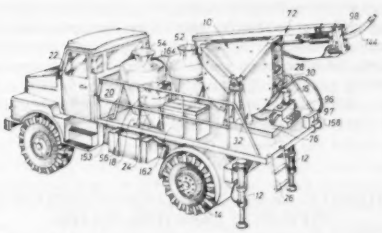
logarithmic relationship with the amplitude of said error signal generated by the regulator to produce said control signal.

4,066,093

HOSE FEEDING WINCH

Bengt Gunnar Wilhelm Egerstrom, Danderyd, Sweden, assignor to Nitro Nobel AB, Gyttorp, Sweden

Filed Sept. 24, 1976, Ser. No. 726,173
Claims priority, application Sweden, Oct. 1, 1975, 7511025
Int. Cl.[2] B65H *75/34*
U.S. Cl. 137—355.2 **17 Claims**



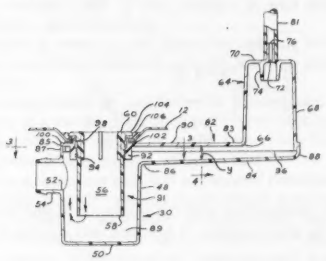
1. A hose feeding winch especially intended for use in connection with charging of drill holes to take up and advance a charging hose for powder explosives or pumpable explosives, comprising
a central shaft,
a cradle rotatably supporting said central shaft,
a drum rotatable on said central shaft,
means defining a spiral groove on the outer peripheral surface of said drum for guiding a charging hose to be wound up in a single layer on the periphery of said drum, when the latter is rotated in one direction,
a drum cage surrounding said drum and mounted for rotation on said central shaft independently of said drum, and
a plurality of cage elements disposed around the drum in cooperative relation with the groove defining means on said drum in order to limit movement of the wound hose in the radial direction of the drum.

4,066,094

COMBINATION DRAIN SUMP AND AIR PRESSURE CHAMBER FOR AUTOMATIC CLOTHES WASHING MACHINE

Richard C. Stitch, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 17, 1976, Ser. No. 667,642
Int. Cl.[2] D06F *23/04, 33/02*
U.S. Cl. 137—387 **6 Claims**



1. In a washing machine having an air pressure responsive switch, a tub for holding washing liquid, and a pump for removing the liquid from the machine, the combination of a drain sump and air pressure chamber member comprising:

a sump member having an upper portion, a lower portion, a side wall, and a bottom wall, said sump side wall having an outlet opening above the lower portion in liquid flow communication with the pump,

an open-ended dip tube in liquid flow communication with the tub and extending downwardly within the sump side wall below the outlet opening and into the lower portion and spaced from the sump side and bottom walls,

an air pressure chamber member located laterally of and above the sump, said air chamber having an open base, a side wall and a top end wall with an air port, and

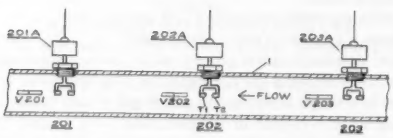
a connecting chamber member in communication at one end with the base of the air chamber and at the opposite end with the top of the sump member in close proximity to the outlet opening, said connecting chamber member having a major portion thereof located above the sump outlet opening sufficient to remove liquid from the connecting chamber prior to removing liquid from the lower portion of the sump member when viewed in vertical cross-section and having a width in its entirety at least substantially equal to the width of said air chamber base and a height sufficient to provide a substantial cross-sectional flow area.

4,066,095

AUTOMATIC LEAKAGE DETECTION SYSTEM FOR PIPELINES CARRYING FLUIDS

Frank Massa, Cohasset, Mass., assignor to Fred M. Dellorfano, Jr. and Donald P. Massa, both of Cohasset, Mass., trustees of The Stoneleigh Trust

Filed Feb. 17, 1976, Ser. No. 658,471
Int. Cl.[2] F16K *17/20;* **G01M** *3/08*
U.S. Cl. 137—486 **4 Claims**



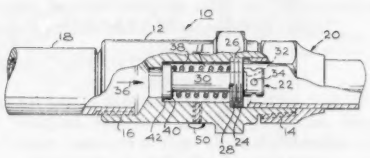
1. In combination in a system for monitoring the rate of flow of a fluid being transported through a conduit, a plurality of valve means located at various points along the conduit for controlling the rate of flow of said transported fluid, a plurality of flow measurement probes located at different points along the conduit, the locations of said plurality of flow measurement probes characterized in that neighboring pairs of probes are located one upstream and one downstream from a particular valve means, each probe characterized in that it produces an output signal which is precisely indicative of the rate of flow in the conduit at the position in the conduit occupied by the probe, means for comparing the output signal from one probe with the output signal from another probe, remote control means for selectively operating said valve means, said remote control means characterized in that it is selectively responsive to any specified difference in said output signals being produced by a neighboring pair of probes, said remote control means further characterized in that a particular valve means is operated by a particular remote control signal initiated in response to said specified difference in output signals produced by a particular pair of probes, said remote control means further characterized in that it selectively initiates the closing of a pair of valve means located one upstream and one downstream from the probe which has indicated an abrupt decrease in flow from its nearest upstream neighbor, whereby the section of the conduit containing said probe is isolated and sealed off by the closing of the said pair of valve means.

4,066,096

FLOW-CONTROL VALVE

Charles F. Lind, Jr., Los Angeles, Calif., assignor to Aqueduct, Inc., Santa Ana, Calif.

Continuation-in-part of Ser. No. 598,949, July 25, 1975, abandoned. This application Sept. 15, 1976, Ser. No. 723,570
Int. Cl.[2] G05D *7/01*
U.S. Cl. 137—504 **6 Claims**



1. A flow-control valve for operation with differential pressures below 100 p.s.i.g., including, in combination:

a cylindrical casing having a first inside diameter;

a cylindrical regulator including side exit ports, an end wall and a flow-controlling end-exit port axially disposed in said end wall and extending axially completely through said end wall for undiverted flow of fluid along the axis of said regulator through said end-exit port, said regulator having a second outside diameter and a third inside diameter;

a piston having a fourth outside diameter which is less than said third inside diameter, said piston being in slidable engagement with said regulator and having side fluid inlet ports at the unstream end thereof and a skirt portion at the downstream end thereof, said skirt portion being adapted to engage said side ports in said regulator when said piston slides into said regulator in response to fluid pressure on side piston, said piston having a fifth inside diameter;

a spring carried within said piston and regulator and positioned to urge said piston and regulator in opposite directions, said spring having a sixth outside and a seventh inside diameter and a first free length and a second solid length;

said fifth inside diameter being approximately 0.67 times said first inside diameter;

said sixth outside diameter being approximately 0.59 times said first inside diameter;

said seventh inside diameter being approximately 0.51 times said first inside diameter;

said first free length of said spring being approximately 1.4 times said first inside diameter; and,

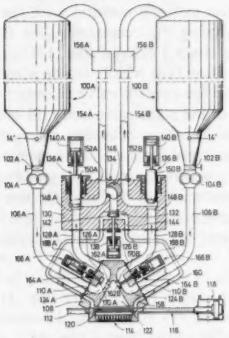
said second solid length of said spring being approximately 0.46 times said first inside diameter.

4,066,097

APPARATUS FOR PROCESSING MOLTEN LIQUID PLASTICS, PARTICULARLY FOR EXTRUSION OF PLASTICS

Rudolf Paul Fritsch, Stuttgart, Germany, assignor to C. F. Scheer & Cie, Stuttgart, Germany

Filed Sept. 11, 1975, Ser. No. 612,467
Claims priority, application Germany, Sept. 14, 1974, 2444012
Int. Cl.[2] F16K *19/00*
U.S. Cl. 137—563 **6 Claims**



1. Apparatus for processing plastic melts, comprising

a. means to deliver plastic melt from a container to said apparatus;

b. distributing means comprising an inlet to receive a plastic melt feed stream from said container, a first outlet for the plastic melt to be processed, said outlet being closable with a closing member, and a second outlet communicating with said container via a back-flow line;

c. valving means for controlling the backflow of the plastic melt to the container; and

d. flushing means comprising a port terminating at a point upstream of said closing member, and in the immediate vicinity thereof, said port being connected with said second outlet via said valving means;

said distributing means including a plurality of inlets to receive feed streams from a plurality of containers, and a plurality of second outlets communicating with said containers via back-flow lines, whereby a multiple-way valve selectively connects the flushing port with one of the back-flow lines, and a diversion valve having a first and a second position is associated with each inlet, whereby in the first position of said diversion valve the respective inlet is in communication with the associated second outlet, whereas in the second position of said diversion valve the respective inlet is in communication with the first and with the associated second outlet.

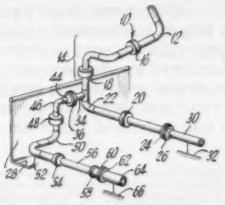
4,066,098

MARINE LOADING AND BUNKERING ARRANGEMENT

Donald J. Gallo, Whippany, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Oct. 8, 1976, Ser. No. 731,085
Int. Cl.[2] B67D *5/04*
U.S. Cl. 137—615 **10 Claims**

8. A system for the transfer of cargo and bunker fuel to a vessel comprising, in combination: a cargo loading arm including an outboard arm and a triple swivel assembly at the end thereof coupled to a cargo manifold supported on the deck of said vessel, a bunkering assembly coupled at a first flanged end to said triple swivel assembly of said outboard arm and at an opposite flanged end to a bunker manifold supported on said vessel, said bunkering assembly containing flexible components for accommodating various locations of said bunker



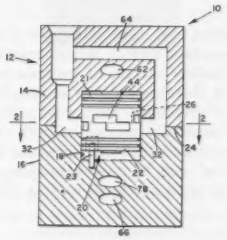
manifold and movement of said vessel during cargo transfer and bunkering operations.

4,066,099

ZERO LAP VALVE

Richard Arthur Wittren, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Aug. 16, 1976, Ser. No. 714,567
Int. Cl.[2] F16K *11/07*
U.S. Cl. 137—625.66 **18 Claims**



1. A zero lap valve comprising: a valve body including two valve body portions, each of said valve body portions having a bond surface bonded to the bond surface of the other valve body portion and having a cavity provided therein intersecting the bond surface, and one of said valve body portions having inlet and outlet ports provided therein intersecting the bond surface and the cavity; and a valve member slidably disposed within said cavity in the valve body and including two valve member portions, each of said valve member portions having a bond surface parallel to the bond surfaces of the valve body portions and bonded to the bond surface of the other valve member portion, and one of said valve member portions having a passageway provided therein intersecting the bond surface and the surface of the valve member proximate said ports, said one of said valve member portions being on the opposite side of the bond surfaces from said one of said valve body portions when the bond surfaces are in a coplanar position so that the inlet and outlet ports are connected by the passageway on one side of the coplanar position and unconnected on the other side of the coplanar position.

4,066,100

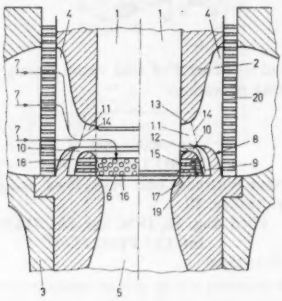
CONTROL VALVE

Martin Schwarz, Moriken, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed July 27, 1976, Ser. No. 709,076
Claims priority, application Switzerland, Aug. 14, 1975, 10568/75
Int. Cl.[2] F16K *47/14*; F15D *1/00*
U.S. Cl. 137—625.3 **4 Claims**

1. A control valve including a valve housing, a piston guide cylinder located within said housing, a piston slidable within said guide cylinder between a valve-closed position wherein

the end of said piston engages a valve seat leading to an outlet chamber in said housing and a valve-open position wherein said piston is dis-engeged from said valve seat thereby to place said outlet chamber in communication with an inlet chamber in said housing by way of a cylindrical opening through an inlet collar surrounding said valve seat, said inlet collar being provided with a plurality of by-pass ducts having inlets terminating in a by-pass admission duct from said inlet chamber and outlets to said valve seat distributed around said cylindrical opening within said collar and which are progressively en-



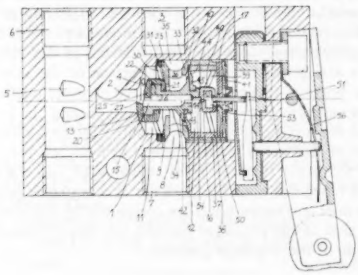
gaged by said piston, said inlet collar further including a convexly curved boundary surface which together with a convexly curved boundary surface of said piston guide cylinder forms in said inlet chamber a throat section in the shape of a conical surface of revolution having as generatrix a straight line which is substantially normal to both of said convexly curved boundary surfaces and represents the shortest distance between them, and said by-pass admission duct having an entrance section located on the downflow side of said throat section.

4,066,101

MULTIPLE WAY VALVE

Jan Richard de Fries, Hirschwiesenstr. 9, Zurich, Switzerland

Filed June 30, 1975, Ser. No. 591,392
Claims priority, application Germany, June 28, 1974, 2431135
Int. Cl.[2] F15B *13/042*
U.S. Cl. 137—625.6 **9 Claims**



1. A multiple way valve comprising means forming a main valve chamber containing an axially movable main valve body (9) controlled by pressure medium and having first and second axial end faces and having first and second end regions, a control valve chamber (12) having a cover and containing a mechanically operable control valve body, there being at least one pressure line opening from a pressure medium source into the main valve chamber and one working line which is closed with respect to the pressure line in the first extreme position of the main valve body and connected to the pressure line in the second extreme position of the main valve body, a partition separating the said control valve chamber (12) having a cover, which valve chamber is arranged adjacently to the main valve chamber (11) in an axial direction from the main valve chamber (11), said partition being movable in an axial direction, the first axial end face (13) of the main valve body (9) constituting a first sealing surface and facing away from the movable partition being in a space connected to the pressure line (2) in each position of the main valve body and the second axial main valve body end region containing the second end face opposite to the first end face (13) being firmly attached to the movable partition (10), and a connecting line (15), which is at all times open with respect to the first end face (13) of the main valve body (9), opening into the control valve chamber (12), a control exhaust line (17) connected to the control valve chamber (12) the control valve body (16) closing the control exhaust line (17) in its first extreme position with the connecting line (15) open and closing the connecting line (15) in its second position with the control exhaust line (17) open, the surface of the movable partition (10) which can be acted on by the pressure medium from the control valve chamber (12) being larger than the surface of the main valve body (9) which can be acted on in the reverse direction, whereby when the control valve body (16) is transferred from its first extreme position into its second extreme position, the main valve body (9) shifts over in a snap-action manner from its first extreme position into its second extreme position and vice versa, in which the housing of the multiple way valve has an axially cylindrical recess (1) having a frontal boundary surface and the partition is a diaphragm (10) made of elastic material firmly held by its external periphery, and in which the pressure line (2) opens centrally into the axial recess (1) at its frontal boundary surface, the annular surface (20) of the frontal boundary surface, bounded by the pressure line (2) and by the cylindrical surface of axial recess (1), constituting a valve seat for the first end face (13) of main valve body (9), the said main valve body (9) having an axial through-hole constituting said connecting line (15), the internal periphery of the diaphragm (10) being attached to the external periphery of the second axial end region of the main valve body (9), and the control valve body (16) being arranged centrally in the control valve chamber (12) and having a third sealing surface associated with a port of the connecting line (15) and a fourth sealing surface which is associated with the control exhaust line (17) which is arranged centrally in the cover (41) of the control valve chamber (12), said cover (41) being arranged centrally with respect to the diaphragm (10) on the opposite side thereof from the valve seat in an axial direction; said diaphragm comprising, in a radial direction from inside to outside successively, a first reinforced annular zone attached to the main valve body (9), a first articulated thinner annular zone (45), a second reinforced annular zone, a second articulated thinner annular zone (44) and a third reinforced annular zone, said diaphragm (10) being firmly held, the reinforced annular zones each projecting towards the auxiliary valve chamber with respect to the adjacent thinner annular zones, and said main valve body has a radially projecting flange (22) positioned adjacent to the annular surface (20), wherein a jacket (25) is positioned over said radially projecting flange, one side of which forms said first end face (13) of said main valve body (9), and wherein radially extending elastic centering arms (30) are connected between said jacket (25) and a gripping ring (31) positioned against said means forming said main valve chamber.

4,066,102

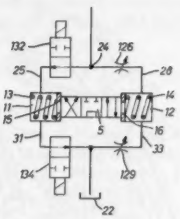
HYDRAULIC REGULATOR

Niels Tandrup, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Apr. 14, 1976, Ser. No. 676,736
Claims priority, application Germany, Apr. 18, 1975, 2517205
Int. Cl.[2] F16K *31/363, 31/40*
U.S. Cl. 137—625.64 **1 Claim**

1. A hydraulic regulator system comprising a slide valve member having end faces, first and second pressure chambers

at opposite ends of said valve member bounded in part by said end faces, centering springs in said chambers biasing said valve member towards a neutral position, supply and exhaust lines, first and second parallel lines between said supply and exhaust lines in which said first and second chambers are respectively disposed, a pair of switching valves in said parallel lines for



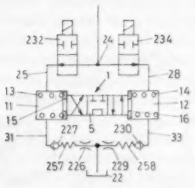
selectively moving said slide valve member in either desired direction, a pair of throttle means in said parallel lines, said switching valves being upstream and downstream from the said chamber in said first parallel line, and said throttle means being in said second parallel line upstream and downstream from the said chamber in said second parallel line.

4,066,103

HYDRAULIC REGULATOR

Niels Tandrup, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Division of Ser. No. 676,736, April 14, 1976. This application Mar. 24, 1977, Ser. No. 780,808
Claims priority, application Germany, Apr. 18, 1975, 2517205
Int. Cl.[2] F16K *31/42*
U.S. Cl. 137—625.64 **1 Claim**



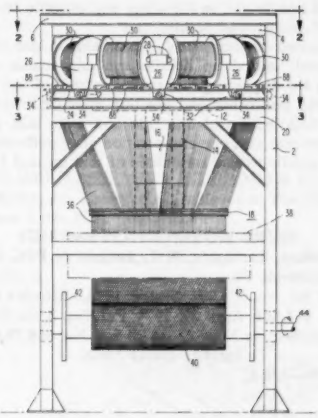
1. A hydraulic regulator system comprising, a casing having a bore and counterbored chambers at opposite ends of said bore, a slide valve member having the same length as said bore slidably disposed in said bore, spring means in each of said chambers, movable abutment means in said chambers between said spring means and said slide valve member, said valve member being in biasing engagement with only one of said spring means when said valve member is displaced from a centered position in said bore, supply and exhaust lines, first and second parallel lines between said supply and exhaust lines in which said chambers are respectively disposed, an above atmosphere pressure pressurized tank connected to said exhaust line, a pair of independetly operable switching valves in said parallel lines upstream from said chambers for selectively moving said slide valve member in either desired direction, a pair of throttle means in said parallel lines downstream from said chambers, and spring loaded check valve means in said first and second lines between said chambers and said throttle means.

4,066,104

TRIAXIAL FABRIC FORMING MACHINE AND COMPONENTS THEREOF

Murray Halton, Bryn Mawr; Norris F. Dow, Radnor; Richard M. Dow, and Michael J. Hillebrand, both of Philadelphia, all of Pa., assignors to N. F. Doweave, Inc., King of Prussia, Pa.

Division of Ser. No. 522,751, Nov. 11, 1974, Pat. No. 4,015,637.
This application Sept. 7, 1976, Ser. No. 720,627
Int. Cl.[2] D03D *41/00*
U.S. Cl. 139—11 **2 Claims**



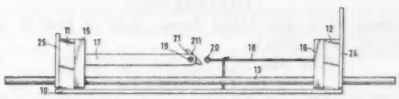
1. In a method of making triaxial fabrics in which a plurality of warp yarns are guided into an array of two converging sheets of generally parallel warp yarns and move transversely, with the direction of transverse movement of warp yarns in one sheet being opposite the direction of transverse movement in the other sheet, the improvement which comprises supplying warp yarns from a circular creel mounted for rotation about a generally vertical axis while rotating the creel intermittently in timed relation with the transverse movement of warp yarns.

4,066,105

METHOD OF AND APPARATUS FOR FORMING A LENO SELVAGE ON WOVEN GOODS

Felix Heinrich, Balingen; Adolf Linka, Hechingen-Sickingen, and Reinhold Jocham, Strassberg, all of Germany, assignors to Mayer & Cie, Tailfingen, Germany

Filed Sept. 29, 1976, Ser. No. 728,011
Claims priority, application Germany, Oct. 3, 1975, 2544199
Int. Cl.[2] D03D *47/40*
U.S. Cl. 139—54 **12 Claims**



1. In combination with a loom having harnesses carrying an array of warp yarns defining a warp direction and displaceable in a shed direction transverse to said warp direction to form a main shed adapted to receive a weft passed through said shed in a weft direction transverse to said warp and shed directions, a leno selvage device comprising:

a ground heddle at an edge of said array and carrying a ground warp yarn, said ground heddle having a support defining a rocking axis nondisplaceable in said weft direc-

tion and jointly displaceable with said ground heddle in said shed direction;

a doup heddle at said edge carrying a doup warp yarn;

means for displacing said heddles synchronously with said harnesses in said shed direction oppositely toward and past each other to form an edge shed in line with said main shed;

a rocker pivotal on said support about said axis between a pair of end position, said doup heddle being operatively engageable with said rocker and deflectable thereby in said weft direction in one of said end positions to one side of said heddle and in the other end position to the other side of said ground heddle; and

means carried on and jointly displaceable in said shed direction with said doup heddle and engageable with said rocker for displacing said rocker from said one end position into said other end position after deflection of said doup heddle to said one side and from said other end position into said one end position after deflection of said doup heddle to said other side of said ground heddle.

4,066,106

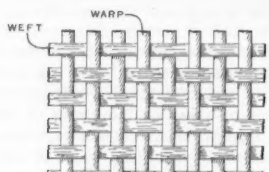
SIZED WOVEN GLASS FABRIC

Roy R. Graham, Lexington, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 609,252, Sept. 2, 1975, which is a division of Ser. No. 464,861, April 29, 1974, Pat. No. 3,932,193. This application Mar. 22, 1976, Ser. No. 668,751

Int. Cl.² D03D *15/00*

U.S. Cl. 139—420 C **2 Claims**



1. A sized woven glass fabric having weft and warp portions characterized by the weft portion being composed of fiber glass yarns having thereon the dried residue of an aqueous sizing composition comprising a starch, a lubricant, a textile softener and 100 to 150 percent by weight of a nonionic wetting agent based on the weight of said lubricant, said glass fiber fabric being further characterized by having the fiber glass yarns in the weft portion untwisted.

4,066,107

PACKAGING MACHINE AND METHOD FOR CHITTERLINGS

Alexander Karp, and Alfred Boron, both of 1445 E. Kirby, Detroit, Mich. 48211

Filed Aug. 26, 1976, Ser. No. 718,089

Int. Cl.² B65B *3/04*

U.S. Cl. 141—11 **5 Claims**

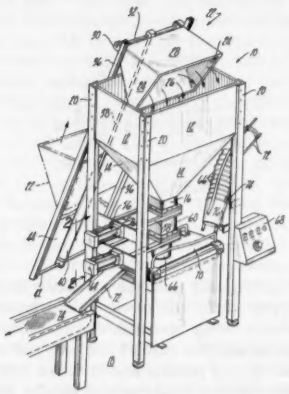
3. The method of dispensing a quantity of chitterlings comprising the steps of:

disposing a dispenser chamber having an upper and lower opening beneath a container having a quantity of chitterlings loaded therein, the container having a lower opening allowing the chitterlings to move under the influence of gravity through the lower opening,

disposing the dispenser chamber beneath said lower opening to receive a quantity of chitterlings sufficient to fill the dispenser chamber;

closing the lower opening of the dispenser chamber before the quantity of chitterlings is moved into said dispenser chamber;

closing the upper end of the dispenser chamber by moving a cut-off blade across the opening and scissoring off the chitterling lengths extending through the dispenser chamber opening;



opening the lower opening while the upper dispenser chamber opening is closed to allow the volume of chitterlings disposed in the dispenser chamber to be moved by gravity from the dispenser chamber.

4,066,108

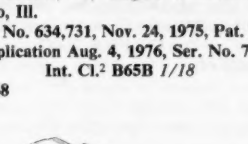
VALVE BAG FILLER, HANDLING AND SEALING SYSTEM

Erwin M. Lau, Dolton, Ill., assignor to Black Products Company, Chicago, Ill.

Division of Ser. No. 634,731, Nov. 24, 1975, Pat. No. 4,003,188. This application Aug. 4, 1976, Ser. No. 711,526

Int. Cl.² B65B *1/18*

U.S. Cl. 141—68 **5 Claims**



1. In combination with a valve bag of the type having a hollow, collapsable tubular filling sleeve at the upper end portion extending laterally outward of a body portion of said bag having an open outer end and adapted to support said bag during a filling operation with said sleeve in an open generally horizontal position;

a valve bag packer including an elongated, generally horizontal, filling tube supported in cantilevered relation at an inner end and having a free outer end portion adapted to be received in said filling sleeve of said valve bag for supporting said bag during said filling operation,

said filling tube including a hollow flow passage receiving a measured amount of material at said inner end and extending through said tube to an outlet adjacent said free outer end portion for discharge of said material downwardly into said valve bag supported thereon,

said filling tube having a generaly elliptical, transverse cross-section and arranged with a major axis of said elliptical

cross-section generally horizontally and a minor axis of said elliptical cross-section generally vertically,

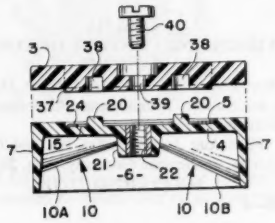
said filling tube having an enlarged upper surface engaging the filling sleeve of said bag to form a maximum supportive area during the filling of said bag on said tube whereby said filling sleeve of said bag is maintained with a horizontal transverse dimension greater than a vertical transverse dimension so that said sleeve tends to return to a flattened closed condition after filling said bag and removal from said filling tube of said packer.

4,066,109

PENCIL SHARPENER WITH REPLACEABLE BLADES

Rajendra K. Narang; Manish Narang, and Ashish Narang, all of 1525 Bonnie Road, Macedonia, Ohio, 44056

Filed Aug. 12, 1976, Ser. No. 713,694
Int. Cl.[2] B43L *23/08*
U.S. Cl. 144—28.11 **8 Claims**



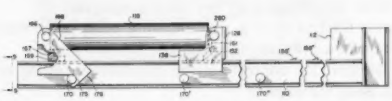
1. A hand-held pencil sharpener comprising a housing having both a top recess therein to define an enclosed slightly lowered seating surface and a tapered bore therein selectively to receive a pencil for sharpening, said bore tangentially intersecting the seating surface of the housing at its inner end relative to the housing to form an elongated narrow slot therein, a double-edged razor blade received on said seating surface, with one edge of said blade being positioned in said slot to form a pencil shaving edge and with the ends of said blade being contained in said recess, a cover positioned on top of said housing and coextensive therewith having a projection telescopically received in said recess with the bottom wall of such projection engaging and enclosing said blade, said cover having an elongated slot therein positioned to be in alignment with the elongated slot in the seating surface upon assembly, and means releasably to secure the cover, razor blade and housing together and to prevent relative movement therebetween, whereby the tapered bore guides a pencil inserted therein against the tangentially disposed shaving edge to permit said pencil upon rotation to be sharpened thereby, with the pencil shavings passing through said aligned slots in said housing and cover for removal therefrom.

4,066,110

APPARATUS FOR SPLITTING LOGS

Richard L. Sarno, 5204 Guerin Pass, New Berlin, Wis. 53151

Filed Sept. 20, 1976, Ser. No. 724,671
Int. Cl.[2] B27L *7/00*
U.S. Cl. 144—193 A **7 Claims**



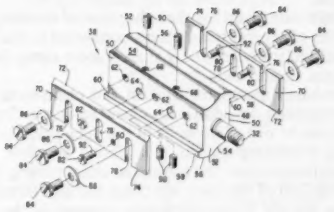
1. A log splitter comprising an elongated beam, a wedge anchored to a first end of said beam, fluid pressure operated ram means having reaction means at one end and having an extensible impact member at its opposite end for engagement with one end of a log which is positioned on said beam between said impact end and said wedge, said reaction means including at least one wing pivoted to said cylinder having a hooked reaction portion for coaction with said abutment means, and longitudinally spaced alternate abutment means on said beam for coaction with said reaction means in either of at least two positions, one of which is closer to the wedge than the other.

4,066,111

CUTTER HEAD ASSEMBLY FOR POWER PLANERS

Elmer C. Klebe, Jr., Easley, S.C., assignor to The Singer Company, New York, N.Y.

Filed Oct. 12, 1976, Ser. No. 731,286
Int. Cl.[2] B27C *1/10*
U.S. Cl. 145—4 **6 Claims**



1. A cutter blade assembly for a planer powered by an electric motor mounted in a housing comprising:

a. a block journaled in the housing and rotatably connected to the motor,

b. a flat side formed on the block,

c. a plurality of tapped holes extending inwardly from the flat side of the block,

d. a plurality of apertures extending inwardly from the flat side of the block in spaced relation to the tapped holes therein,

e. a plurality of tapped holes extending from one of the other sides of the block, one to intersect each of the block apertures,

f. a blade disposed on the flat side of the block,

g. a plurality of mounting slots formed in the blade, one aligned with each of the block tapped holes of the flat side,

h. a plurality of screw connectors, one extending through each of the blade slots to be threadedly received within the block tapped holes and to affix the blade to the block,

i. a plurality of tapped holes formed in the blade, one aligned with each of the block apertures,

j. the block apertures having a substantially larger cross-sectional area than that of the blade tapped holes,

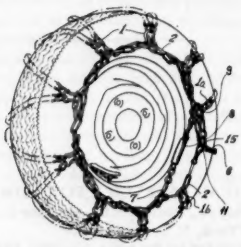
k. a plurality of screw connectors, one to threadedly extend through each of the blade tapped holes and to be disposed within the block apertures a predetermined distance whereby limited adjustment at the blade slots is permitted in connecting the blade to the block, and

l. a plurality of set screws, one threadedly connected in each of the tapped holes of said other side of the block and to jam against the threads of the screw connectors disposed within the block apertures to prevent blade removal from the block.

4,066,112
AUTOMOBILE-TIRE SNOW CHAINS

Peter Goldstein, Lausanne, Switzerland, assignor to Vianette Goldstein, Switzerland

Filed June 11, 1976, Ser. No. 694,947
Claims priority, application Switzerland, June 13, 1975, 7681/75; Dec. 16, 1975, 16270/75
Int. Cl.[2] B60C *27/02, 27/10*
U.S. Cl. 152—213 A 5 Claims

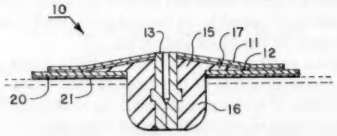


1. An automobile tire snow chain, comprising;
an open side chain for one side of a tire, the chain having two ends;
a closed side chain for the other side of the tire;
a series of several tread chains connected to the side chains and uniformly angularly spaced apart along the open side chain, in use; and
a combined special tread chain and chain-securing device, comprising an additional chain having a first end connected to one of the ends of the open side chain and having a hooking device at a second and free end of the additional chain, the additional chain passing through the other end of the open side chain and also through said one end thereof to provide a loop connecting the ends of the open side chain which loop can be tightened by pulling the free end of the additional chain to close the open side chain, and the additional chain having, adjacent and extending from said one end thereof, a chain portion which in use passes over the tread of the tire providing a special tread chain circumferentially spaced from adjacent ones of the several tread chains, the free end of the additional chain being held, by securement of the hooking device, to the closed side chain;
whereby the several tread chains and the special tread chain portion of the additional chain are uniform tractive elements on the tire.

4,066,113
REPLACEMENT VALVE ASSEMBLY

James Y. Oldshue, 141 Tyringham Road, Rochester, N.Y. 14617

Filed Oct. 28, 1976, Ser. No. 736,446
Int. Cl.[2] B60C *29/00*
U.S. Cl. 152—430 8 Claims

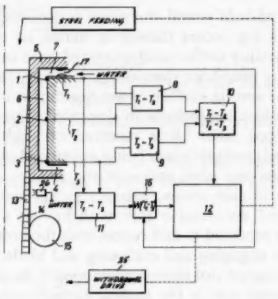


1. An assembly including a vulcanized elastomeric valve having a body with a flange for replacing a metal-bodied valve in a vulcanized elastomeric article, said assembly comprising:
a. a vulcanized elastomeric cover having a diameter larger than the diameter of said flange;
b. means forming a vulcanized bond between a radially inner portion of said cover and the outward facing surface of said flange;
c. an annular disk of unvulcanized and vulcanizable material having a central opening encircling said body with said disk underlying the inward facing surface of said flange;
d. a nonvulcanizing adhesive temporarily adhering said disk to said flange;
e. means providing unvulcanized and vulcanizable material adjacent the inward facing surface of said cover radially outward from said flange;
f. release material overlying the inward facing surface of said unvulcanized and vulcanizable material under said flange and said cover; and
g. after removal of said release material, said assembly being bondable to said article by vulcanizing said vulcanizable material to bond said flange, disk, cover, and article all together in a secure, vulcanized bond.

4,066,114
SUPERVISION AND CONTROL OF CONTINUOUS CASTING

Wolfgang Dorr, Essen, and Hartwig Matzner, Duisburg, both of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Germany

Filed Aug. 14, 1975, Ser. No. 604,796
Claims priority, application Germany, Aug. 20, 1974, 2440273
Int. Cl.[2] B22D *11/12*
U.S. Cl. 164—4 11 Claims



5. Apparatus for supervising continuous casting of steel by means of a mold having walls which have a path through which flows a coolant, comprising:
first means for detecting the amount of heat flowing into at least a partial circumferential section of the casting mold and providing a measuring value representative thereof;
second means for detecting separately the heat flows into the mold in upper and lower portions of that section and providing, respectively, measuring values representative thereof;
third means for computing the ratio of the measuring values as detected by the second means;
means for forming a manifestation of an operating point from the measuring value as provided by first means and the ratio as computed by the third means; and
means for referencing the operating point or its manifestation to a predetermined range.

9. Method for controlling the continuous casting of steel, comprising the steps of:
detecting the amount of heat flowing into at least a circumferentially partial section of the casting mold and providing a measuring value representative thereof;
detecting as separate quantities the heat flows, respectively, into the mold in upper and lower portions of that section and providing measuring values representative thereof;

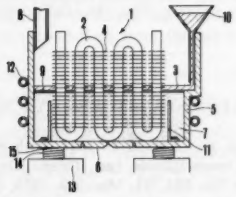
computing the ratio of the measuring values representing the heat flows into the upper and lower portions;
forming an operating point from the measuring value in accordance with the first detecting step and said ratio; and
controlling the casting process in dependence upon the operating point.

4,066,115

METHOD FOR PRODUCING HEAT PIPE UNITS

Iwao Ohtani, Tokyo, and Hashime Takahashi, Yokohama, both of Japan, assignors to Tokico Ltd., Japan

Filed Nov. 1, 1976, Ser. No. 737,668
Claims priority, application Japan, Oct. 31, 1975, 50-131915
Int. Cl.[2] B22D *19/00*; B22C *9/02*
U.S. Cl. 164—9 17 Claims



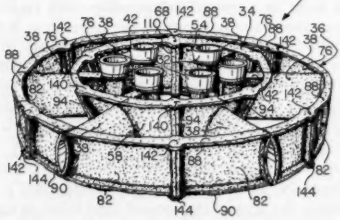
1. A method for producing a heat pipe unit having at least one heat pipe carried in a plate-like cross-structure, comprising:
placing a heat pipe in a molding box;
holding said heat pipe in an upright position in said molding box;
feeding sand into said molding box to bury said heat pipe up to a level where said plate-like cross-structure is to be provided, while vibrating said molding box to compact the sand and level the surface thereof;
pouring a molding material on the levelled surface of said sand to a predetermined thickness;
solidifying said molding material to form a platelike cross-structure on said heat pipe integrally therewith;
discharging said sand out of said molding box; and
removing the thus-formed heat pipe unit from said molding box.

4,066,116

MOLD ASSEMBLY AND METHOD OF MAKING THE SAME

William S. Blazek, Valley City; Thomas S. Piwonka, Solon; James D. Jackson, and Philip N. Atanmo, both of Cleveland Heights, all of Ohio, assignors to TRW Inc., Cleveland, Ohio

Filed Jan. 29, 1976, Ser. No. 653,383
Int. Cl.[2] B22C *9/04, 9/22*
U.S. Cl. 164—17 33 Claims



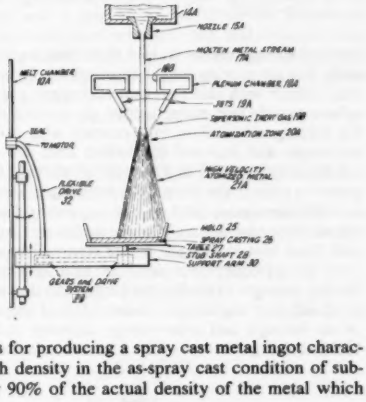
1. A method of making a mold assembly for use in forming a cast product, said method comprising the steps of providing at least one pattern having a plurality of surface areas including a first surface area having a configuration similar to a surface area of the cast product and a second surface area which does not correspond to any surface area of the cast product, making a plurality of mold sections, and interconnecting said plurality of mold sections to form the mold assembly, said step of making a plurality of mold sections including the steps of applying a wet coating of a liquid ceramic mold material over the first and second surface areas of the pattern, removing at least a major portion of the wet coating of ceramic mold material overlying the second surface area of the pattern, at least partially drying the wet coating of ceramic mold material after performing said step of removing the wet coating of ceramic mold material overlying the second surface area of the pattern, and separating the pattern from the dried coating of ceramic mold material to provide a mold section formed of ceramic material and having a surface area with a configuration corresponding to the configuration of the first surface area of the pattern.

4,066,117

SPRAY CASTING OF GAS ATOMIZED MOLTEN METAL TO PRODUCE HIGH DENSITY INGOTS

Ian Sidney Rex Clark, Forest Park Greenwood Lake; John Kenneth Pargeter, Warwick, both of N.Y., and John Oliver Ward, Bodenham, England, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Oct. 28, 1975, Ser. No. 626,304
Int. Cl.[2] B22D *23/00*; B05B *7/14*
U.S. Cl. 164—46 52 Claims



1. A process for producing a spray cast metal ingot characterized by high density in the as-spray cast condition of substantially over 90% of the actual density of the metal which comprises,
providing a highly energetic conically configurated outwardly expanding atomized metal stream having an included angle of substantially less than 25°,
directing said atomized stream of metal to the interior of an ingot mold with the longitudinal axis of said stream disposed at an acute angle to the interior wall of said mold, while effecting relative transverse movement between said atomized metal stream and said mold, such that said stream is caused to scan the interior of said mold,
and filling said mold while scanning the interior thereof.

4,066,118

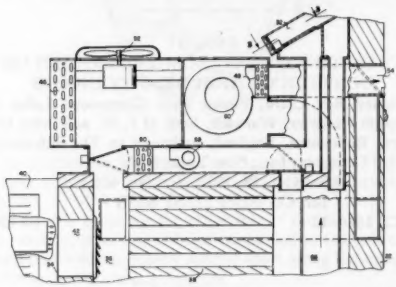
AIR CONDITIONING SYSTEM

William H. Goettl, 2005 E. Indian School, Phoenix, Ariz. 85018

Filed Apr. 16, 1976, Ser. No. 677,730
Int. Cl.[2] F24D *11/00*; F25B *27/00*
U.S. Cl. 165—18 11 Claims

1. An air conditioning system comprising: a heat pump adapted alternately to reject heat to the ambient atmosphere and to collect heat therefrom as desired; duct means communicating with said heat pump and adapted alternately to deliver either cool air or heated air into a building room; thermal

storage means communicating with said heat pump and disposed and adapted either to collect BTU's directly from said heat pump when it is delivering heat, or to be cooled by said heat pump when it is delivering cool air; and duct means for delivering either heat or cooling from said thermal storage means to said system when the respective demand in said room may exceed the thermal capacity of said heat pump; and means controlling said heat pump to either store heat in said thermal storage means or to cool it when the respective demand of said room is less than the thermal capacity of said heat pump; said heat pump having a first heat exchanger communicating with atmosphere outside said room; said heat pump having a second heat exchanger communicating with atmosphere inside said room; said heat pump having a third heat exchanger; said first and third heat exchangers having refrigerant passages which are coupled in series; and means for transferring heat from said



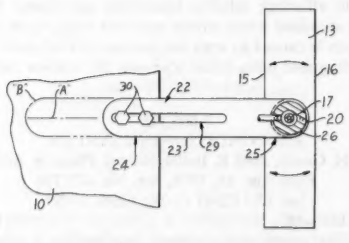
thermal storage means to said third heat exchanger together with first air moving means disposed for forcing ambient air into contact with said first heat exchanger and back to atmosphere outside said room; second air moving means disposed for forcing air to flow into contact with said second heat exchanger and into said room; first duct and damper means communicating with said second air moving means and disposed to deliver air alternately from said room and said thermal storage means; third air moving means disposed for forcing air from said thermal storage means and into contact with said third heat exchanger; a roof disposed over said room; a solar energy collector in said roof; said solar energy collector having passages extending upwardly and downwardly in said roof; and duct and damper means adapted to provide the flow of air through said solar energy collector and through said thermal storage means and back to said solar energy collector.

4,066,119

ROTATABLE RADIATOR ASSEMBLY FOR A VEHICLE

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 30, 1976, Ser. No. 718,733
Int. Cl.[2] F28F *13/06;* **F01P** *3/100;* **B60K** *11/02;* **F28F** *9/00*
U.S. Cl. 165—41 **6 Claims**



1. In a vehicle engine radiator assembly having a radiator having first and second opposed cooling surfaces, an inlet conduit, an outlet conduit, and means for passing fluid from the inlet conduit to the outlet conduit while passing air from one of the cooling surfaces through the radiator and to the other cooling surface, the improvement comprising:

a first fluid coupling pivotally connected to the inlet and being of a construction sufficient for passing fluid into the inlet at a first position of the radiator at which the first cooling surface is directed outwardly from the vehicle and a second position at which the second cooling surface is directed outwardly from the vehicle;

a second fluid coupling pivotally connected to the outlet and being of a construction sufficient for passing fluid from the outlet at said first and second radiator positions; and

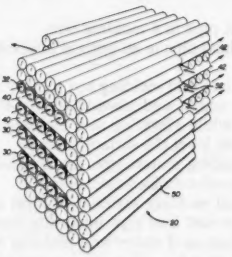
first means for maintaining at least one of the fluid couplings fixed to the vehicle for movement of fluid couplings toward and from the vehicle for movement of the radiator between the first and second positions while passing fluid through the radiator from the inlet conduit to the outlet conduit.

4,066,120

RECUPERATOR STRUCTURES AND METHOD OF MAKING SAME

Donald F. Mold, and Ronald G. Rice, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 554,791, March 3, 1975. This application May 6, 1976, Ser. No. 684,050
Int. Cl.[2] C03C *27/00;* **C03B** *32/00;* **F28D** *7/00;* **F28F** *1/00*
U.S. Cl. 165—165 **6 Claims**



1. A recuperator heat exchanger assembly, comprising

a. a plurality of stacked layers of tubes, each tube having open ends and a portion intermediate the open ends which is essentially parallel to corresponding intermediate portions of the other tubes in the same layer and to corresponding intermediate tube portions in the other layers to form a first series of longitudinally extending parallel passageways for receiving a first fluid;

b. header connecting means for receiving the open tube ends of each layer and supporting the opposing open ends in each layer to maintain the intermediate tube portions of each layer in a spaced relationship with respect to the intermediate tube portions of the tubes in at least one of the adjacent stacked layers in said assembly to define a second series of passageways between layers of intermediate tube portions for receiving a second fluid, said header connecting means closing the spaces between and around the open ends of said tubes to prevent crossflow between the first and second fluid streams; and

c. means extending longitudinally along each of said second passageways for confining said second fluid in and out directing the flow of the second fluid through said second series of passageways in a direction parallel to and in heat exchange relationship with the intermediate tube portions adjacent the second series passageways, said second fluid directing means having entry and exit port means formed therein for receiving and discharging the second fluid and said second fluid confining and directing means including a second series of layers of tubes, each tube in each of said

second series layers having open ends which terminate along lines extending obliquely with respect to the longitudinally extending parallel passageways, and a portion intermediate the open ends which is essentially parallel to corresponding intermediate portions of the other tubes in the same layer and to corresponding intermediate tube portions in the other second series layers, the intermediate tube portions of said second series layers also being essentially parallel to the intermediate tube portions of said first-mentioned plurality of stacked layers, the intermediatetube portions of each of said second series layers being disposed adjacent to and in heat exchange relationship with the intermediate tube portions of at least one of said first-mentioned plurality of layers, and a third series of tubes having open ends which mate with the open tube ends of each second series layer along the oblique lines defined thereby and extending transversely to each second series passageway to direct said second fluid into and receive said second fluid from the tubes of each second series layer;

d. said stacked layers of tubes, said header connecting means, and said second fluid directing means being constructed of material having essentially zero porosity, consisting essentially of an inorganic crystalline oxide ceramic material, and having an average coefficient of lineal therman expansion of about -18 to $+50 \times 10^{-7°}$ C over the range of 0°–300° C;

e. said stacked layers of tubes, said header connecting means, and second fluid directing means being fused together to form an integral assembly.

4,066,121

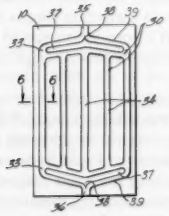
HEAT EXCHANGER WITH HEADER HAVING IMPROVED FLUID DISTRIBUTION

Charles A. Kleine, Florissant, Mo., and Verne L. Middleton, East Alton, Ill., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 573,953, May 2, 1975, and Ser. No. 632,502, Nov. 17, 1975, which is a continuation-in-part of said Ser. No. 573,953. This application Nov. 17, 1975, Ser. No. 632,644

Int. Cl.² F28F *3/14, 9/02;* **F24J** *3/02*

U.S. Cl. 165—170 **7 Claims**



1. A metal panel for use in a solar energy collector system having a desired system of internal tubular passageways for a heat exchange medium disposed between spaced apart portions of the thickness of said panel and defining opposed headers connected by a plurality of spaced, parallel individual connecting portions of said passageways extending therebetween, with at least one first bonded portion of said metal defining said connecting portions, said passageways having entry and exit portions extending from said headers to opposed edges of said panel to provide ingress and egress openings for said heat exchange medium, wherein said headers each include a fluid distributing pattern comprising at least one second bonded portion, of said metal in said headers spaced from said first bonded portion, each of said second bonded portions defining at least one wedge-shaped projection adjacent and in juxtaposition to said entry and exit portions, respectively, said projections provided to assist in the distribution of flow of said heat exchange medium and to subdivide said flow into discrete channels.

4,066,122

MULTI-LAYER RADIATOR OF PLASTIC MATERIAL AND PROCESS FOR ITS MANUFACTURE

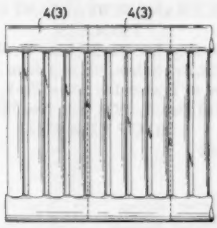
Erwin Gross, Burgsolms, and Hans Vowinkel, Florsheim am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 18, 1975, Ser. No. 587,863

Claims priority, application Germany, June 20, 1974, 2429611

Int. Cl.² F28F *9/02*

U.S. Cl. 165—175 **8 Claims**



1. A multi-layer radiator of plastic material consisting essentially of planar elements formed of vertical substantially parallel water pipes and a pair of spaced horizontal headers to which the ends of said pipes are connected, said elements being connected to one another by straps at points spaced from said headers to form multi-layer units, the units being firmly joined to one another endwise.

4,066,123

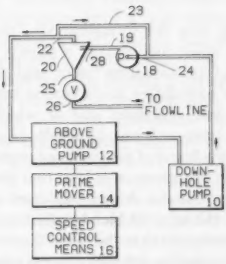
HYDRAULIC PUMPING UNIT WITH A VARIABLE SPEED TRIPLEX PUMP

David R. Skinner, Odessa; Marvin W. Jutus, and Miles L. Sowell, both of Levelland, all of Tex., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 23, 1976, Ser. No. 753,745

Int. Cl.² E21B *43/00*

U.S. Cl. 166—68.5 **10 Claims**



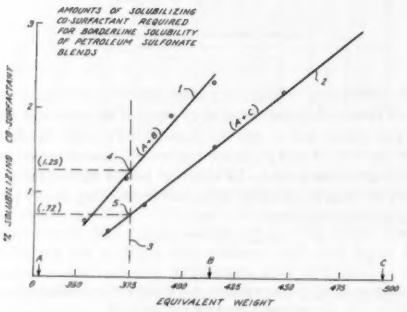
1. In combination with a well-fluid hydraulic pumping unit of the type wherein a prime mover drives an above-ground pump to supply a flow of pressurized fluid, wherein at least some of said pressurized fluid is used as power fluid for a downhole hydraulically actuated pump, which downhole pump returns fluid to the surface wherein at least some of said return fluid is introduced as cyclone flow into the input of a cyclone separator, and wherein a portion of said cyclone flow exits the cyclone overflow as cleaned fluid and is available for use as power fluid, and the remainder of said cyclone flow exits the cyclone underflow and is sent to a flowline, the improvement which comprises:

a. speed control means connected to said prime mover for controllably varying the speed at which said prime mover drives said above-ground pump;
b. a cyclone feed pump having an inlet and an outlet, wherein said outlet is connected to said cyclone inlet and wherein said feed pump inlet is connected to receive said return fluid, and
c. a flowback line connected from said cyclone overflow to said cyclone feed pump inlet, whereby the speed of the above-ground pump can be changed without adversely affecting the cleaning by the cyclone.

4,066,124
SALINITY TOLERANT SURFACTANT OIL RECOVERY PROCESS

Joseph T. Carlin, Houston, Tex.; James W. Ware, Tulsa, Okla.; Melvin E. Mills, Jr., Salem, Ill., and John A. Wells, Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 1, 1976, Ser. No. 746,554
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—252 **23 Claims**



13. A method of recovering petroleum from a subterranean, petroleum-containing permeable formation penetrated by at least two wells in fluid communication therewith, said formation containing water having a known or determinable salinity of at least 5000 parts per million total dissolved solids, comprising:

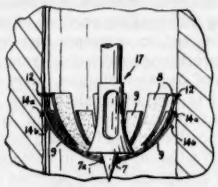
introducing into the formation via one of said wells, an aqueous saline fluid having a salinity about equal to the salinity of the formation water, said surfactant fluid comprising a solubilizing co-surfactant and a blend of at least two organic sulfonates one of which is predominantly water soluble and one of which is at least partially oil soluble, the blend of two or more organic sulfonates being chosen from a group of at least two blends of at least three organic sulfonates having different average equivalent weights, the selected blend requiring less of the solubilizing co-surfactant than the other blends to achieve a condition of borderline solubility in the saline fluid.

4,066,125
SEISMIC DRILL HOLE SURFACE PLUG

Peppino Bassani, Box 4091, Edmonton, Alberta, Canada

Filed Feb. 8, 1977, Ser. No. 766,812
Claims priority, application Canada, Dec. 23, 1976, 268639
Int. Cl.[2] F21B *33/12*
U.S. Cl. 166—202 **5 Claims**

1. A plug for use in plugging seismic drill holes or wells, the said plug being formed of flexible material and being circular in shape, having a diameter larger than the diameter of the well to be plugged, characterized in that the plug has a central aperture surrounded by a solid portion, and a series of fingers project radially outwards from the said solid portion, each of

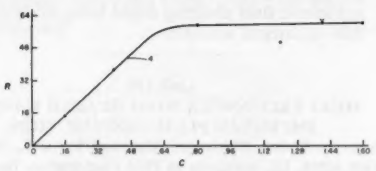


said fingers on one surface thereof having well surface gripping protrusions projecting therefrom.

4,066,126
SURFACTANT WATERFLOODING WITH HYDROCARBON SLUG

Jerry M. Waite, and Ralph F. Burdyn, both of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,590
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—273 **12 Claims**



1. In the recovery of oil from a subterranean oil-containing reservoir penetrated by spaced injection and production system, the method comprising:

a. injecting into said reservoir via said injection system a slug of hydrocarbon having a viscosity less than the viscosity of the reservoir oil in an amount within the range of 0.01–0.04 pore volume,
b. thereafter injecting into said reservoir via said injection system an aqueous surfactant slug in an amount within the range of 0.05–0.3 pore volume, said surfactant slug containing a surfactant within a range of 0.5–4.0 weight percent,
c. thereafter injecting into said reservoir via said injection system an aqueous mobility control slug, at least a portion of said mobility control slug having a viscosity at least as great as the viscosity of said hydrocarbon slug,
d. thereafter injecting into said reservoir via said injection system an aqueous flooding medium to displace oil to said production system, and
e. recovering oil from said production system.

4,066,127
PROCESSES FOR PRODUCING BITUMEN FROM TAR SANDS AND METHODS FOR FORMING A GRAVEL PACK IN TAR SANDS

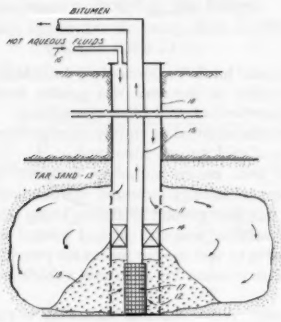
Bobby G. Harnsberger, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Aug. 23, 1976, Ser. No. 716,503
Int. Cl.[2] E21B *43/24, 43/08, 43/10*
U.S. Cl. 166—278 **16 Claims**

1. A process for producing bitumen from a subterranean reservoir of tar sands from a well having tubing centered in a casing forming an annulus with perforations at the top and bottom of the reservoir comprising the steps of,

a. running a packer in the annulus between the upper and lower perforations in the casing,

b. heating the casing for melting the bitumen from the tar sands immediately adjacent the external surface of the casing to form a passage in the reservoir from the upper perforations to the lower perforations,
c. setting the packer to prevent internal fluid communication between the upper and lower perforations,
d. ejecting hot fluids from the upper perforations for melting more bitumen from the tar sands for flowing through the lower perforations for forming a cavity of a predetermined size around the casing from the upper perforations to the lower perforations and through the tubing for recovery at the surface,
e. mounting a screen on the bottom of the tubing adjacent the lower perforations and setting the packer,
f. ejecting a gravel pack material slurry into the cavity from the upper perforations for forming a gravel pack around the screen,
g. ejecting more hot fluids into the cavity from the upper perforations for melting more bitumen from the tar sands, and
h. flowing the melted bitumen through the gravel pack, lower perforations, and screen for filtering out sand and gravel from the melted bitumen for recovering the melted bitumen at the surface.



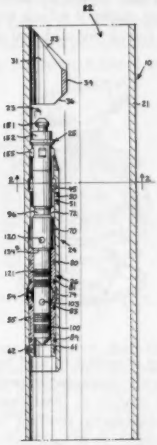
8. A method for forming a gravel pack for producing bitumen from a subterranean reservoir of tar sands from a well therein having tubing centered in a casing forming an annulus with sets of perforations therein at the top and bottom of the reservoir comprising the steps of,
a. running a packer in the annulus between the upper and lower perforations,
b. heating the casing for melting the bitumen from the tar sands immediately adjacent the external surface of the casing to form a passage in the reservoir from the upper perforations to the lower perforations,
c. setting the packer to prevent internal fluid communication between the upper and lower perforations,
d. ejecting hot fluids from the upper perforations for melting more bitumen from the tar sands for flowing through the lower perforations for forming a cavity of a predetermined size around the casing from the upper perforations to the lower perforations and through the tubing for recovery at the surface,
e. pulling out the tubing and packer,
f. running the tubing with a screen on the bottom thereof adjacent the lower perforations and setting the packer, and
g. ejecting a gravel pack material slurry into the cavity from the upper perforations for forming a gravel pack around the screen that is a long lasting gravel pack in tar sands.

4,066,128

WELL FLOW CONTROL APPARATUS AND METHOD

Jerry B. Davis, Dallas, and Guy W. Gant, Richardson, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed July 14, 1975, Ser. No. 595,548
Int. Cl.[2] E21B *23/02, 43/12*
U.S. Cl. 166—315 **19 Claims**



1. A well device for controlling fluid communication between the interior and exterior of a well tubing comprising: a side-pocket mandrel body having means at each end for connection into said tubing and a longitudinal open bore for alignment with the bore of said tubing when said mandrel body is connected into said tubing; said mandrel body having a side-pocket chamber longitudinally aligned with and laterally offset from said open bore and communicating with said open bore; a side-pocket landing nipple formed in said side-pocket chamber for supporting a well tool in said mandrel body; said mandrel body having port means in a side wall thereof opening into said side-pocket landing nipple; and valve means secured in said landing nipple for opening and closing said port means into said nipple responsive to insertion and removal of a well tool in said nipple.

16. A method of controlling communication in a well between the interior and exterior of a well tubing including a side-pocket mandrel having a side-pocket landing nipple provided with a sliding sleeve valve for controlling flow through side port means in said mandrel leading from said exterior of said tubing into said landing nipple comprising the steps of: inserting a well tool into said side-pocket landing nipple through said well tubing; engaging said sliding sleeve valve with said well tool releasing said sleeve valve from a closed locked relationship in said landing nipple; latching said sleeve valve with said well tool upon release of said valve for movement in said landing nipple; and moving said sleeve valve by means of said well tool to an open position at which fluid communication is established through said side ports in said body mandrel into said landing nipple through said sleeve valve.

4,066,129

SPRINKLER HEAD ASSEMBLY

James R. Anderson, Berwyn, Pa., assignor to Central Sprinkler Corporation, Lansdale, Pa.

Filed Sept. 17, 1976, Ser. No. 724,736
Int. Cl.[2] A62C *37/10;* **F16L** *37/24*
U.S. Cl. 169—37 **15 Claims**

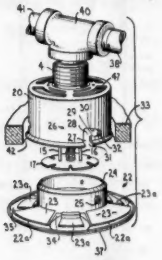
1. A sprinkler head for a fire extinguishing system comprising:
a. a sprinkler body having a nozzle therein, said nozzle being

closed by a thermally responsive seal member adapted to open said nozzle to permit fluid discharge therefrom,

b. a bracket attached to said sprinkler body,

c. a flange located forwardly of said nozzle that is disposed substantially transversely and extends radially outward with respect to the discharge axis of said nozzle, and

d. a cover extending across the path of said discharge axis and attached to said flange by means of a thermally responsive bonding material which will soften prior to the opening of said nozzle by said seal member,



e. said flange being attached to said bracket by means of at least one relatively engageable projection and shoulder joint, said joint having at least one resiliently operative transitional arrangement tending to lock the engaged projection and shoulder of said joint against relative rotational disengagement,

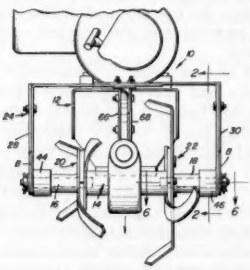
f. said resiliently operative transitional arrangement including resilient means urging said cover away from said flange.

4,066,130

DIRT SHIELD FOR ROTO TILLER

Dedriuck Heppner, 211 Main St., Zumbro Falls, Minn. 59991

Filed June 22, 1976, Ser. No. 698,702
Int. Cl.[2] A01B *33/16*
U.S. Cl. 172—81 **5 Claims**



1. In combination with a rotary digger including a ground traversing movable frame, a longitudinal shaft mounted on the frame and disposed extending perpendicularly to a normal direction of movement of the frame, and a rotary earthworking member mounted on the shaft for rotation therewith, a dirt shield, comprising, in combination:

a. a U-shaped framework having a pair of spaced, substantially parallel legs and a connecting portion, and supported on the shaft and frame; and

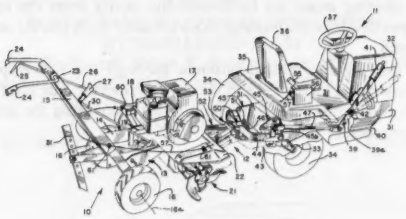
b. a shield member mounted on the framework outwardly of the digger and oriented perpendicularly to the shaft of the digger for keeping dirt away from plants adjacent the digger, the shaft of the digger including a pair of longitudinally spaced ends and a pair of rotary earthworking members mounted on the shaft and associated with the spaced ends of the shaft so as to be spaced longitudinally from one another, with the legs of the framework of the dirt shield being connected directly to the ends of the shaft of the digger and the connecting portion of the framework being rigidly attached to the frame for preventing movement of the framework relative to the frame, and the shield member being mounted on the framework outwardly of the rotary earthworking members and associated with one of the ends of the shaft.

4,066,131

HITCH ASSEMBLY FOR GARDEN TRACTOR AND INDEPENDENTLY OPERABLE GROUND TILLER

Herman P. Zandbergen, Wheaton, Ill., assignor to White Farm Equipment Company, Cleveland, Ohio

Filed Oct. 1, 1975, Ser. No. 618,389
Int. Cl.[2] A01B *59/042*
U.S. Cl. 172—680 **4 Claims**



1. A universal hitch for connecting an independently operable ground tiller to the rear of a garden tractor for towed operation therebehind, said hitch comprising:

tongue means adapted to rigidly mount on and extend forwardly of said ground tiller, and

universal joint means including first and second pivotal member mountings oriented perpendicularly to each other, said first pivotal mounting being attachable to said riding vehicle, and said second pivotal mounting being attachable to said tongue means for providing dual planer pivotal movement between said vehicle and said ground tiller,

said second pivotal member mounting is positioned offset relative the center of said first pivotal member mounting, and

said first and second pivotal member mountings are inversely attachable to said vehicle and said tongue means respectively for varying the mounted height above ground of said universal hitch.

4,066,132

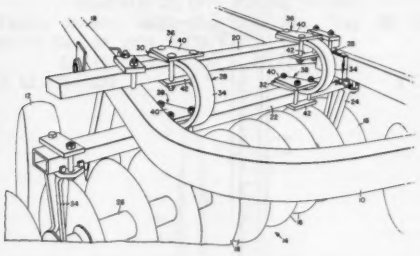
DISK HARROW WITH BEAM MEMBER SUSPENDED BY U-SHAPED SPRINGS

Gary Allen Rehn, Andover, Ill., assignor to Deere & Company, Moline, Ill.

Filed Feb. 20, 1976, Ser. No. 659,596
Int. Cl.[2] A01B *5/06*
U.S. Cl. 172—572 **2 Claims**

1. In a disk harrow comprising: a mobile frame having laterally spaced apart frame members; a first beam member transversely fixed to the frame in overlying relationship thereto and having a rectangular cross section with horizontally extending upper and lower flat surfaces; a second beam member beneath and generally parallel to the first beam member, said second beam member also having a rectangular cross section with horizontally extending upper and lower flat surfaces; a pair of spaced apart support arms attached to the second beam member and depending therefrom; a plurality of blades mounted on a common shaft carried by the support arms; spaced apart U-shaped spring members disposed between the laterally spaced apart frame members, the base section of each spring member extending forwardly from the beam members and

generally vertically therebetween, with the leg section of each spring member extending rearwardly from the base section and having flat upper and lower portions, each flat portion dis-



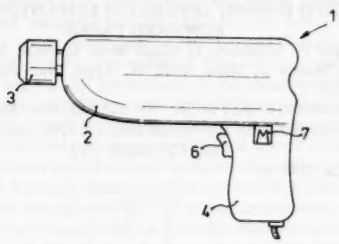
posed adjacent a horizontal surface of a respective beam member; and clamp means bearing against the opposite horizontal surfaces of each beam member for securing the respective flat section of the spring member thereto.

4,066,133

POWER HAND TOOL

Klaus Voss, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 2, 1975, Ser. No. 609,309
Claims priority, application Germany, Sept. 4, 1974, 2442226
Int. Cl.[2] B25B *23/14*
U.S. Cl. 173—12 **16 Claims**



1. Power hand tool having a tool body (2), a drive motor (8, 38, 48) secured in the body, and a holding handle (4, 24) for manually holding the tool, the holding handle being joined to the tool body, said tool comprising

a torque sensing element (7, 27, 37, 57) located at the junction of the tool body and the handle and comprising a strain measuring transducer (7, 27, 37, 57) providing an electrical output signal, said strain measuring transducer being positioned on the tool adjacent the junction of the tool body and the holding handle to be responsive to deformation of the handle (4, 24) with respect to the tool body (2, 22);

and means connecting said strain measuring transducer and the motor to control the motor operation as a function of the output signal and thus of the torque between the tool body and the holding handle.

4,066,134

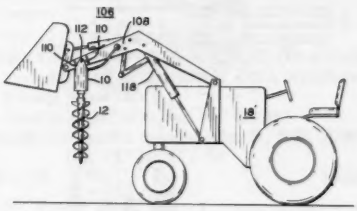
HYDRAULIC POST HOLE AUGER APPARATUS

Ed Karns, III, 400 N. River Road, Apt. 1137, West Lafayette, Ind. 47906

Filed Mar. 25, 1976, Ser. No. 670,393
Int. Cl.[2] A01B *49/04*
U.S. Cl. 173—27 **2 Claims**

1. A hydraulically driven post hole auger apparatus for attachment to the power-actuated arm of the front end loading apparatus of a tractor, said arm having opposite ends with one end pivotally connected to the tractor, comprising: first and second plates respectively engaging opposite sides of said arm and fastener means for connecting said plates and removably clamping the same on said arm; a pair of spaced support elements secured to one of said plates; a cylindrical housing having a side wall and one end wall and being open at its opposite end,

said side wall having a pair of opposite cut-out portions formed therein and respectively extending from said open end towards said end wall for accommodating hydraulic hoses for said motor, said cut-out portions forming a pair of upstanding leg portions; a speed-reducing gear box in



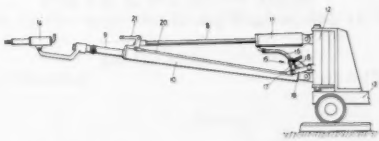
said housing having an output shaft extending through an opening in one end wall and adapted to have an auger attached thereto; a hydraulic motor in said housing operatively coupled to said gear box; a first pin having opposite ends connected respectively to said leg portions across said housing; a first sleeve rotatably mounted over said first pin between said leg portions; a second sleeve fixedly secured to said first sleeve and extending at right angles thereto; and a second pin rotatably received in said second sleeve and having opposite ends connected respectively to said elements.

4,066,135

TELESCOPIC ROCK DRILL MOUNTING

Trevor Evelyn Wallace, Sandton, Transvaal, South Africa, assignor to The Steel Engineering Company, Roodepoort, Transvaal, South Africa

Filed Jan. 30, 1976, Ser. No. 653,894
Int. Cl.[2] E21C *5/00*
U.S. Cl. 173—44 **13 Claims**



1. An extendable and retractable rock drill mounting comprising an extendable drill feed leg having a first element, and a second element with one end movable along the length of the first element and adapted to carry a rock drill at its free end, a vertical support to which the first element is pivoted at its free end, and a counterbalancing arm forming a triangle with the vertical support and the first element, the counterbalancing arm being adjustable in length, means for providing a thrust to maintain the counterbalancing arm in any adjusted position, means for altering the thrust to adjust the length of the counterbalancing arm and feed-back means so to alter the thrust as to maintain the length of the arm substantially constant in any adjusted configuration.

4,066,136

TORQUE AND IMPULSE TRANSMITTING MACHINE

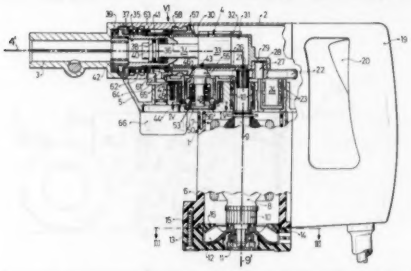
Karl Wanner, Echterdingen; Reinhard Hahner, Kemnat; Wolfgang Schmid, Plattenhardt; Gernot Hansel, Stuttgart-Plieningen, and Manfred Bleicher, Leinfelden, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Apr. 7, 1976, Ser. No. 674,743

Claims priority, application Germany, Apr. 15, 1975, 2516406

Int. Cl.² H02G *3/04*

U.S. Cl. 173—48 **32 Claims**



1. A torque and impulse transmitting machine, comprising a housing; a tool holder mounted on the housing for holding a material-penetrating tool; a drive motor in the housing and having a rotary shaft mounted therein for rotation about an axis of rotation; an impeller assembly for transmitting impulses to the tool in said holder, said assembly having an impeller mounted for reciprocating movement along an axis of reciprocation, said axis of reciprocation and said axis of rotation both lying in and defining a common plane; first motion-transmitting means in motion-transmitting engagement with said motor and said impeller assembly and operative for reciprocating said impeller in response to rotation of said shaft, said first means comprising a crank gear mounted for rotation about an axis which extends in direction substantially parallel to said axis of rotation of said rotary shaft and which is offset from said common plane; and second motion-transmitting means arranged in the housing and operative for transmitting torque to the tool in said holder, said second means comprising an intermediate gear laterally adjacent said crank gear and being in motion-transmitting engagement with the latter.

4,066,137

FLAME JET TOOL FOR DRILLING CROSS-HOLES

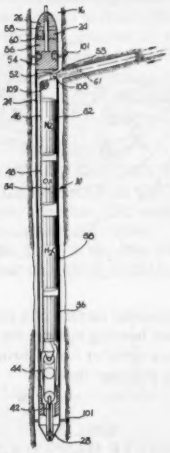
Helmut Frankle, and Werner Baum, both of Canoga Park, Calif., assignors to PEI, Inc., Malibu, Calif.

Filed June 10, 1976, Ser. No. 694,902

Int. Cl.² E21B *7/14*

U.S. Cl. 175—14 **25 Claims**

1. A flame jet tool forming cross holes in the ground comprising an elongated tube-like member, a fuel system disposed within said tube-like member, and an extension member comprised of a series of interconnected link members and having a first and second end with said first end being coupled to a drill bit, and said second end being coupled to said fuel system, said extension member being movable from a position within said



tube-like member to an extended position lateral to said tube-like member.

4,066,138

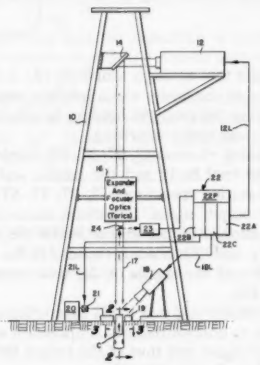
EARTH BORING APPARATUS EMPLOYING HIGH POWERED LASER

Winfield W. Salisbury, 11 Glenn Road, Belmont, Mass. 02178, and Walter J. Stiles, 4032 W. Krall Ave., Phoenix, Ariz. 85019

Continuation-in-part of Ser. No. 525,442, Nov. 10, 1974, Pat. No. 3,998,281. This application Dec. 15, 1976, Ser. No. 750,875

Int. Cl.² E21B *7/14*

U.S. Cl. 175—16 **7 Claims**



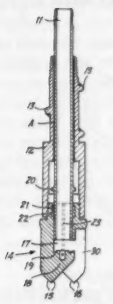
1. Apparatus for boring a cylindrical hole in the earth and comprising laser means for providing a beam of high powered coherent light, focusing means above the hole for forming the beam into an annular beam traversing a downwardly directed path, fluid blast deflecting means for directing a blast that intercepts the path above the hole, and control means connected to actuate the laser means and deflecting means in sequence to provide annular beam pulses that form the hole by fusing successive annular regions of the stratum to be penetrated at a power level that shatters and self-ejects successive cores from the hole and to provide fluid blasts that deflect ejected cores.

4,066,139

SAMPLING DRILL

Jamie Malcolm Wallis, 54 Beaconsfield Avenue, Midvale, Western Australia, 6056, Australia

Filed May 22, 1975, Ser. No. 579,802
Claims priority, application Australia, May 28, 1974, 7685/74; Dec. 19, 1974, 76654/74
Int. Cl.[2] E21C *13/02*; E21B *41/00, 49/02*
U.S. Cl. 175—232 1 Claim



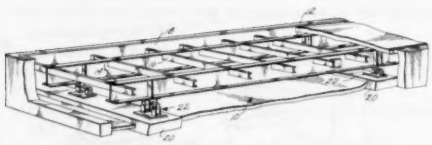
1. A sampling drill comprising a plurality of drill rods coupled together to form a drill stem suspended from a drill head; said rods including each a pair of substantially concentric tubular members defining an inner central passage and an annular passage; the lower end of said stem being fitted with a drill bit including a neck, cutting edges and means defining an inner chamber means in said bit, said chamber means being connectable to said central passage, and means defining at least one passage in said bit, connected in fluid communication at one end of said annular passage and at the other end to discharge into said chamber means; said chamber means being provided with openings located adjacent said edges so that material cut by said bit can pass into said chamber means; wherein the lower end of an inner member of said drill stem is connected to a tubular member, the lower end of which latter slidably passes through said neck in sealing engagement therewith to seat on a central boss within said chamber means, to constitute means for shutting off said central passage to prevent the material from entering said chamber means and entering said central passage.

4,066,140

HEAVY DUTY INDUSTRIAL SCALE

Fred Miller Conley, Highland, Calif., assignor to Gardner-Denver Company

Filed Mar. 15, 1976, Ser. No. 666,884
Int. Cl.[2] G01G *19/02*
U.S. Cl. 177—134 33 Claims



1. In a weight determining apparatus having a means for supporting an object to be weighed, a plurality of mounts carrying the support means above ground, transducer means of the mounts responsive to measure the weight of the object by elastic deformation of the transducer means, and means responsive to the transducer means to indicate the weight of an object, an improvement in each of the mounts which comprises:

a. a shear loaded transducer;

b. means for mounting the transducer in the horizontal with the ends thereof rigidly affixed to ground; and

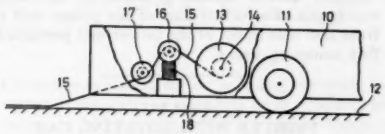
c. means for vertically loading the transducer with the support means and the object intermediate the ends of the transducer, the entire weight of the support means and the object being supported by the transducers of all the mounts, the loading means yielding freely to all horizontal forces by moving pendulously with respect to the transducer in a first vertical plane containing the horizontal axis of the transducer and in a second vertical plane normal to the first vertical plane, the yielding of the loading means isolating the transducer from the horizontal forces.

4,066,141

MEANS FOR CONTROLLING THE SPEED OF A CABLE

Sten Elvin, Vasteras, Sweden, assignor to ASEA Aktiebolaget, Vasteras, Sweden

Filed Aug. 26, 1976, Ser. No. 718,087
Claims priority, application Sweden, Aug. 28, 1975, 7509540
Int. Cl.[2] H02G *1/06*
U.S. Cl. 180—2 R 7 Claims



1. Apparatus for controlling the speed of a cable when being unwound and wound on a cable drum which is disposed on a movable vehicle said cable drum having associated therewith drive means comprising

a. means for measuring the speed of the vehicle and providing a first output signal proportional thereto;

b. means for measuring the speed of rotation of the cable drum and providing a second output signal proportional thereto; and

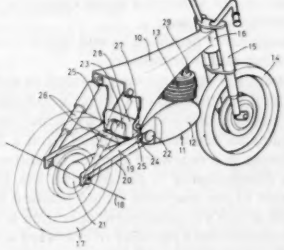
c. control and regulating means having as inputs said first and second signals and providing as an output a third signal which is related to the difference therebetween, said output coupled to control the drive means for said cable drum.

4,066,142

LOOP DRIVEN VEHICLES

Bernard Hooper, Maybank House, Hope Street, Wardsley, Stourbridge, West Midlands, England

Filed Aug. 6, 1976, Ser. No. 712,199
Claims priority, application United Kingdom, Aug. 11, 1975, 33330/75
Int. Cl.[2] B62M *7/04*
U.S. Cl. 180—33 A 4 Claims



1. A loop driven vehicle comprising a frame, a power unit

which produces out of balance forces when in operation, mounting means movably mounting the power unit on the frame, a fork pivotally mounted on the power unit and a rear wheel mounted in the fork for rotation about a first axis, and a driving loop interconnecting the rear wheel and power unit, the mounting means comprising:

i. first mounting means at the rear of the power unit for permitting angular movement of the power unit in response to said out of balance forces about a second axis parallel to the first axis and for permitting translatory movement of the power unit relative to the frame, such permitted movement having a horizontal component in a plane perpendicular to said first axis at least a number of times greater than vertical and lateral components of such movement, said first mounting means comprising:
   a. a generally U-shaped support member with a base portion and two parallel limbs;
   b. means for pivotally mounting the limbs to the power unit to define said second axis; and
   c. means for pivotally mounting the support member to the frame to define a pivotal axis which is fixed relative to the frame and is parallel to and substantially in vertical alignment with said second axis, and

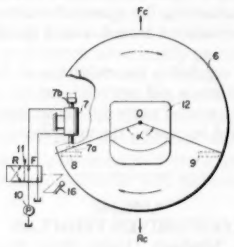
ii. resilient second mounting means for accommodating movement of a further part of the power unit resulting from said movement of the power unit permitted by the first mounting means.

4,066,143

VEHICLE WITH ROTATING CAB

Haruhiko Umeda; Hiroshi Ito, both of Yokohama, and Toshitaka Suketomo, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed June 2, 1976, Ser. No. 692,110
Claims priority, application Japan, June 2, 1975, 50-65275
Int. Cl.[2] B60K *23/00*
U.S. Cl. 180—77 S **4 Claims**



1. In a vehicle which is provided therein with a driver's compartment mounted to enable it to be turned at an angle of 180° from its forwardly facing position to its rearwardly facing position and vice versa and a multispeed transmission having a plurality of forward speeds and at least one rearward speed said transmission including a plurality of solenoid operated directional control valves for speed change of the vehicle, the improvement comprising:

a. a change lever provided in said driver's compartment for operating said transmission;

b. an operation lever means provided in said driver's compartment for turning said driver's compartment; and

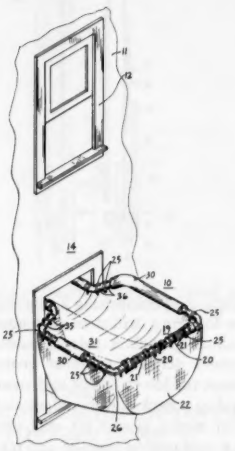
c. transmission control means by which said transmission becomes automatically changed from a forward control condition to a rearward control condition when said driver's compartment is turned from the forwardly facing position to the rearward facing position by the operation of said driver's compartment operation lever wherein said transmission has a plurality of rearward speeds and at least one forward speed, and vice versa; whereby said vehicle has a multispeed transmission controlled by the operation of said change lever in the direction said driver's compartment is facing even when the driver's compartment is either in the forwardly facing position or in the rearwardly facing position.

4,066,144

RESCUE APPARATUS

Joseph F. Valerio, Jr., 118 W. Sixth St., Bridgeport, Pa. 19405

Filed Jan. 4, 1977, Ser. No. 756,636
Int. Cl.[2] A62B *1/22*
U.S. Cl. 182—140 **8 Claims**



1. Rescue apparatus for use in a window of a building for rescuing falling persons which comprises

a pair of arms pivotally secured together,

a net carried by said arms,

a first pair of extensible posts detachably engaged with said arms and having members engageable with the floor and ceiling of a room, and

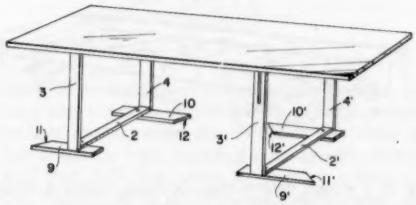
a second pair of extensible posts secured to said arms between said net and said first pair of posts engageable with the floor of the room.

4,066,145

COMPACT SAW HORSE

Bud M. Pavese, Hobart, Ind., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Dec. 1, 1976, Ser. No. 746,502
Int. Cl.[2] F16M *11/00*
U.S. Cl. 182—153 **2 Claims**



1. A compact saw horse, comprising

a top panel type member;

a bottom panel type member;

a pair of panel type side members;

a plurality of fastening means affixing the top, bottom and

side members to each other at their ends to form a rectangular configuration; and

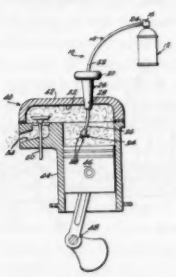
a pair of foot members pivotally affixed to the bottom member in juxtaposition therewith in spaced relation with each other in a manner whereby the foot members are positioned in alignment with the bottom member in inoperable position and extend at substantially right angles with the bottom member, although in a plane parallel to that of the bottom member, in operable position whereby they support the saw horse in an upright position, each of the foot members having spaced opposite first and second ends and being pivotally affixed to the bottom member considerably closer to the first end than to the second whereby in their operable position one of said foot members extends for most of its length from one side of the bottom member and the other of said foot members extends for most of its length from the other side of said bottom member to maintain the side members substantially vertical, said foot members having the configuration of the bottom member in their inoperable position, the edges of said foot members abutting each other in inoperable position and being at 45° relative to the sides thereof.

4,066,146

RUST RETARDER APPLICATOR

Peter P. Gresh, 389 Linwood Drive, Miami Springs, Fla. 33166

Filed July 28, 1976, Ser. No. 709,252
Int. Cl.² F16N *3/02*
U.S. Cl. 184—1 R **6 Claims**



1. For use in applying oil in the cylinder head of an engine above a piston and through a spark plug opening, a dispensing device for use with a pressurized source of oil having a dispensing opening, said device comprising:

A. a tubular length having a through passageway and having a first end zone and a second end zone, said length being of a cross sectional area which is uniform between the end zones,

said second end zone having a plurality of circumferentially facing equal size openings in open communication with the passageway through the tubular length, and

said second end zone being sized for receipt through said spark plug opening,

B. a generally conical plug having an axial through bore sized for sliding receipt of said tubular length and adapted for sliding movement along said tubular length,

said plug having an enlarged first end and a smaller second end,

said smaller end facing said second end of said tubular length and said second end being of a cross sectional area less than the cross sectional area of the spark plug opening for receipt therein, said plug being of yieldable rubber material for inserting it into the spark plug opening,

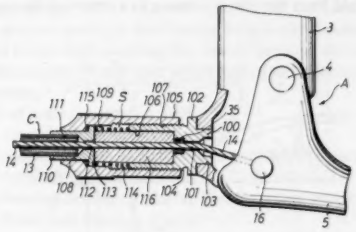
C. an adapter having a first opening and a second opening, said adapter including means to secure to the first end of the tubular length and the first opening being in fluid communication with the passageway through the tube and said second opening being sized for engagement with said pressurized source.

4,066,147

AUTOMATIC LUBRICATING DEVICE FOR REMOTELY OPERABLE BOWDEN CABLE

Hiromitsu Toyomoto, 1-17-24, Hanaten-higashi, Tsurumi, Osaka, Japan

Filed May 28, 1976, Ser. No. 690,934
Claims priority, application Japan, June 4, 1975, 50-75971
Int. Cl.² F16N *1/00*
U.S. Cl. 184—15 R **9 Claims**



1. In a remotely operating device including operating means having a fixed housing and an operating lever grippably pivotally mounted on said housing; actuating means disposed remotely from said operating means; and a bowden cable including an outer wire and an inner wire for interconnecting said operating means and said actuating means, the improvement comprising an automatic lubricating means for the bowden cable, said lubricating means comprising a bracket projecting from the housing and having an inner-wire receiving hole; an outer-wire holding means threadedly coupled to said bracket, for adjusting the outer wire said outer-wire holding means having a recess for receiving the outer wire and an inner-wire receiving hole; wherein when the outer-wire holding means is coupled to the bracket, an adjustable volume lubricating oil storage chamber is defined by the bracket and the outer-wire holding means; wherein one end of the inner wire is connected to the actuating means while the other end is passed through said receiving holes and said lubricating oil storage chamber and is connected to the operating lever and one end of the outer wire is connected to the actuating means and the other end is fitted in said recess of the outer-wire holding means; and wherein the interior of the bowden cable, between the outer and inner wires, communicates with said lubricating oil storage chamber through the inner-wire receiving hole formed in the outer-wire holding means whereby lubricating oil flows between said inner and outer wires thereby reducing friction therebetween.

4,066,148

HYDRAULICALLY-ACTUATABLE ELEVATOR SYSTEM

Richard L. Brown, Bellevue, Nebr., assignor to Lo-Rise Elevator Company, Plattsmouth, Nebr.

Filed Mar. 17, 1976, Ser. No. 667,697
Int. Cl.² B66B *11/04*
U.S. Cl. 187—17 **9 Claims**

1. A hydraulically-actuatable elevator system for use in combination with a multi-stories building structure and including a lofty vertical shaft-like wellway, said elevator system comprising:

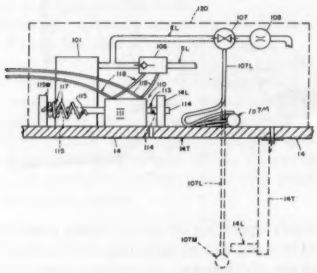
A. A weighty carrier member having a horizontal lower platform and uprightly therefrom structured to define an internal passenger compartment therefor, said carrier member being disposed within said wellway and vertically reciprocatable along a track means guide attached to the building structure;

B. At least one elongate hydraulically-actuatable piston of

the dual-segments plunger/casing type suspending the carrier member from a stationary superstructure within said wellway, the upright elongate casing segment being co-movably rigidly attached to the carrier;

C. Pump means for hydraulic fluid and including a fluid reservoir means, said pump means communicating through a primary-line into the piston casing whereby controlled introduction of hydraulic fluid into the piston casing with respect to its stationary suspended associated plunger causes the carrier member to ascend;

D. A secondary-line extending from the piston's casing interior to the reservoir and bypassing the pump means and having electrically governable checkvalve therealong and with the result that controlled withdrawal of hydraulic fluid from the piston's casing to a reservoir through the



secondary-line allows the weighty carrier member to descend; and

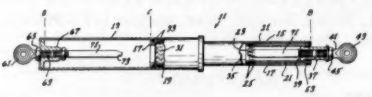
E. An emergency-line extending from the piston casing interior to a reservoir and bypassing the pump means and the electrically governable checkvalve, said emergency-line being co-movably attached to the carrier member and having therealong a normally-closed valve barrier of the on-off type, there also being co-movably associated with the carrier member and accessible within the internal passenger compartment a non-electrical manual opening means for the normally-closed barrier to permit hydraulic fluid to flow along the emergency-line into a fluid reservoir to allow the weighty carrier to descend and initiated by the passenger in the contingency that electrical power for ultimately governing the secondary-line checkvalve suddenly becomes unavailable.

4,066,149

VARIABLE ENERGY ABSORBING SYSTEM

Bernard Mazelsky, West Covina, Calif., assignor to ARA, Incorporated, West Covina, Calif.

Filed Sept. 13, 1976, Ser. No. 722,471
Int. Cl.[2] F16D *63/00*
U.S. Cl. 188—1 C **10 Claims**



5. A variable energy absorbing system comprising:

an outer member;

an inner member positioned within said outer member for movement in one direction therein;

first energy absorbing means, mounted between said inner member and said outer member, for absorbing energy by cyclic plastic deformation, in response to relative movement between said inner member and said outer member;

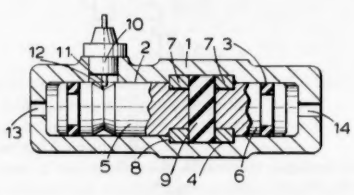
second energy absorbing means connected between said inner and outer members and resisting relative movement therebetween in said one direction, said second energy absorbing means being plastically deformable to absorb energy at levels of force within a preselected range of forces in only a first range of relative movement between said inner member and said outer member, said first energy absorbing means being continuously deformable to absorb energy within said preselected range of levels of force and in a second range of relative movement between said inner member and said outer member, said second range of relative movement being larger than said first range of relative movement, said second energy absorbing means including actuating means for rendering the same inactive upon application of a force exceeding said preselected range of force.

4,066,150

DUAL HYDRAULIC BRAKING SYSTEMS FOR VEHICLES

Glyn Phillip Reginald Farr, Leek Wootton, England, assignor to Girling Limited, Birmingham, England

Filed June 14, 1976, Ser. No. 695,366
Claims priority, application United Kingdom, June 12, 1975, 25169/75
Int. Cl.[2] F16D *66/00*
U.S. Cl. 188—1 A **6 Claims**

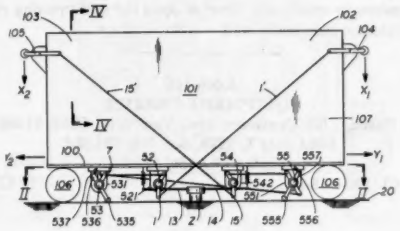


1. A pressure differential warning actuator comprising detector means for detecting when a differential between the pressures of separate brake circuits of an hydraulic braking system exceeds a predetermined value, a housing provided with a bore, said detector means positioned in said bore, said housing also provided with ports connected to said separate brake circuits, and indicator means actuated by said detector means when said predetermined value is exceeded said detector means comprising at least a first and second piston, said pistons working in separate bore portions of said bore, pressure from said separate brake circuits being connected through said ports to in said pistons, means for moving said pistons between a neutral position in which said indicator means is rendered inoperative when said differential pressure is less than said predetermined value, and an operative position in which said indicator means is rendered operative when said differential pressure exceeds said predetermined value, and a deformable assembly located between adjacent inner ends of said pistons and through which said pistons interact and which is adapted to restore said pistons from said operative position to said neutral position when said differential pressure decreases to a value less than said predetermined value, at least one of said pistons including ratio change means engaging with said deformable assembly such that when said pistons are in said operative position in which one of said pistons is connected to a brake circuit of higher pressure than said other piston, said one piston acts on said deformable assembly over a greater area than said other piston.

4,066,151
BRAKING AND LOCKING APPARATUS FOR A MOVABLE OR ROLLING CONTAINER

Gunther Liebscher, Wiesbaden-Kohlheck, and Gunther Christ, Geisenheim Rhg., both of Germany, assignors to Lermer Apparatebau GmbH, Wiesbaden, Germany

Filed Dec. 1, 1976, Ser. No. 746,433
Claims priority, application Germany, Sept. 17, 1976, 2641803
Int. Cl.[2] B60P *7/10*; B60T *1/14*; B64C *1/20*
U.S. Cl. 188—5 9 Claims

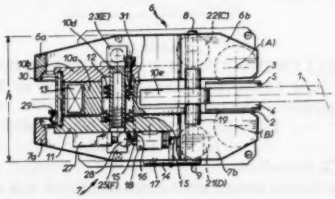


1. In a movable container assembly having a pair of locking levers positioned to cooperate with a fixed anchor, and a pair of pivoted braking spike means for inhibiting movement of said container assembly; the improvement comprising control means operatively connected to each end of said assembly, means coupling said control means to directly operate a respective one of said locking levers for releasing the respective locking lever, lost motion means coupling each control means to control a separate one of said braking spike means, said container assembly having a chassis with a bottom plate, and further comprising first and second pairs of parallel shafts, means mounting said shafts symmetrically under said bottom plate, and means connecting one of said spike means to a separate shaft of each pair of shafts, whereby said spike means extend downwardly and toward the center of said assembly from each end thereof, a separate one of said locking levers being connected to each of the other shafts of said pairs of shafts, said lost motion means comprising lost motion lever means coupling the shafts of each pair of shafts.

4,066,152
GRIPPER FOR A DISC BRAKE

Jean-Pierre Pascal, Paris, France, assignor to Fradisc, Gagny, France

Filed Oct. 14, 1976, Ser. No. 732,587
Claims priority, application France, Oct. 16, 1975, 75.31623
Int. Cl.[2] B60T *13/04*
U.S. Cl. 188—171 4 Claims



1. A gripper for a disc brake having a disc keyed on a shaft, notably for use in handling equipment, comprising

two gripping pads located for gripping the disc,

two levers with one of each of said levers connected to one of said gripping pads,

spring means to produce the gripping of said two pads on the disc,

electromagnetic means having a fixed yoke and a movable armature to produce the releasing of said pads from the disc by opposing said spring means,

each of said levers having a pivot assembly, each of said assemblies including

one end of each of said levers connected to act on one of said pads,

an opposite end of each of said levers being an actuated end,

said electromagnetic means arranged between said actuated ends and said levers having the form of a hollow body enveloping said electromagnetic means,

adjusting means having a substantial portion thereof received within the confines of said hollow body form of said levers.

the gripper having a total lateral bulk in the direction parallel to the shaft carrying the disc of less than the sum of the thicknesses of said two levers and of said electromagnetic means,

said adjusting means including

a torque arm,

a rachet wrench connected for angular movmement actuated by said torque arm,

a bearing connected fast to said movable armature,

a fixed part forming a stop,

a counter-lever having a portion mounted for turning in said bearing and another portion for engagement with said torque arm and for abutting against said fixed part,

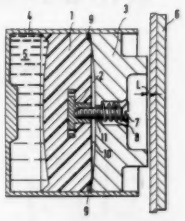
a nut fixed to one of said pivot assemblies,

a spindle having a threaded end portion engaged with said nut and a head end at the other of said pivot assemblies fixedly connected to said rachet wrench, rotation of said spindle to tighten said threaded end portion of said spindle in said nut causing tightening of the gripper about the disc.

4,066,153
BRAKE CYLINDER FOR A HYDRAULIC BRAKE

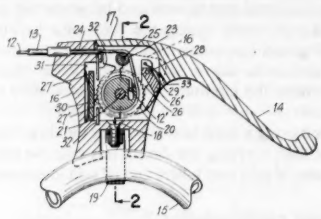
Rudolf Plentz, Talstrasse 18, 6534 Stromberg, Germany

Filed Aug. 26, 1976, Ser. No. 717,762
Claims priority, application Germany, Aug. 29, 1975, 7527323[U]
Int. Cl.[2] F16D *65/46*
U.S. Cl. 188—196 M 7 Claims



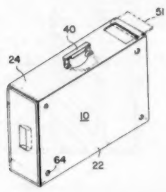
1. In a brake cylinder of a hydraulic brake comprising a piston moving within said cylinder, the improvement comprising a solid resilient body between said piston and brake fluid in the cylinder, said resilient body having a face abutting the brake fluid, edges that abut the walls of the cylinder, and yet another face adjacent the face of the piston, there being a free space between the piston and the adjacent face of the resilient body, which space is free of brake fluid and into which the resilient body penetrates upon a pressure rise in the brake cylinder, said brake piston and resilient body being adjustably connected by a connecting member biased toward the brake piston by a spring, said member passing through the piston and being fixed to the resilient body.

4,066,154
SELF-ADJUSTING BIKE BRAKE OPERATING MECHANISM
Haldon Ross, Olney, Ill., assignor to AMF Incorporated, White Plains, N.Y.
Filed Nov. 22, 1976, Ser. No. 743,726
Int. Cl.[2] B62L *1/00*
U.S. Cl. 188—196 BA **4 Claims**



1. A self-adjusting manual bike brake cable operating mechanism, comprising a housing for said brake cable operating mechanism mounted to a handlebar portion of a bike, said housing comprising a generally flat and rectangular shaped enclosure open at its top and one of its ends, means at the bottom of said enclosure for clamping the same to said handlebar portion, another generally falt enclosure having a handle member affixed thereto, said another enclosure being positioned within said first mentioned enclosure to close its open top and end, a ratchet wheel rotatably mounted inside said another enclosure, said another enclosure being rotatably mounted inside said first enclosure on the same axis as said wheel, a brake operating cable wound on said wheel, a spring biased pawl mounted in said another enclosure for engagement with said wheel whereby said another enclosure and wheel are rotated in unison in one direction to wind said cable on said wheel when said handle is operated, and another spring biased pawl mounted in said first enclosure for engagement with said wheel to limit unwinding of said cable upon release of said handle.

4,066,155
DRAWER TYPE LUGGAGE
Francis Z. Buchek, Watertown, Conn., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed July 26, 1976, Ser. No. 708,321
Int. Cl.[2] A47B *61/06*
U.S. Cl. 190—3 **2 Claims**



1. A portable carrying case which can be alternately employed as a file cabinet, comprising

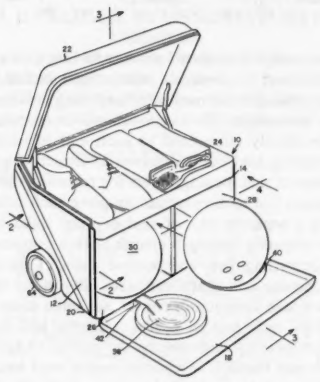
a drawer slidably mounted in a rectangular-shaped case body, with said case body formed with an interior recess extending from one open side of the case body, said drawer formed with a front wall that blocks the open side of the case body, in the closed position of the drawer in the case body, said drawer mounted to be slidable out of the open drawer of the case body,

said drawer formed as an open box, the top of which drawer is open along a plane generally perpendicular to the said front wall of the drawer, with a through opening formed in a side wall of the drawer which side wall is generally mutually perpendicular to the plane of the said front wall and to the plane of the opening of the top of the drawer,

said case body fitted with a retractable carrying handle mounted in an exterior recess in a wall of the case body, said handle fitting flush with, or below the external surface of the said case body wall in the retracted position of the handle, in which

a through opening is formed in an exterior case body wall, which opening is oriented to be in alignment in the closed position of the drawer in the case body with the through opening in the side wall of the drawer, together with means to selectively close or open the said opening of the exterior case body wall.

4,066,156
EQUIPMENT CARRIER
John Basile, 7701 Densmore Ave., Van Nuys, Calif. 91406
Filed July 1, 1976, Ser. No. 701,865
Int. Cl.[2] A45C *5/14*
U.S. Cl. 190—18 A **11 Claims**



1. A bowling ball carrier including:

at least one lower compartment for confining a bowling ball therein and having an open front;

at least one upper compartment for confining articles therein;

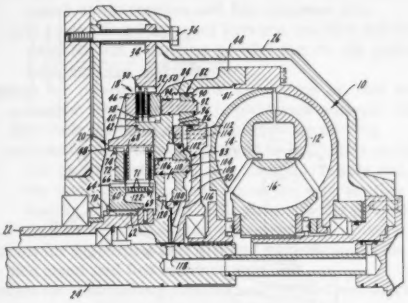
a downward swingable door mounted on the front of said lower compartment; and

means mounted to said carrier for moving said bowling ball from within said lower compartment onto said door, said door having a concave portion therein for said bowling ball to rest therein when moved from said compartment onto said door.

4,066,157
IMPELLER DISCONNECT AND BRAKE MECHANISM
James Kiel Gibbs, Rockford, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Aug. 6, 1976, Ser. No. 712,403
Int. Cl.[2] F16H *45/00*
U.S. Cl. 192—3.24 **6 Claims**

1. A hydrodynamic device between input and output shafts including a driving element connectable to said input shaft and a driven element connected to said output shaft, an engageable brake device for holding said driving element stationary, an engageable clutch device for connecting said input shaft to said driving element, a fluid pressure operated servomotor for said brake device, a fluid pressure operated servomotor for operating said clutch device, a source of fluid pressure connectable to said clutch servomotor to engage said clutch, a fluid passage between said clutch servomotor and said brake servomotor,

fluid pressure from said source when supplied to said clutch servomotor device engaging said clutch and acting on said brake servomotor to release said brake, a supply of fluid charge pressure in said hydrodynamic device and connected to said brake servomotor, a fluid passage connecting said charge pressure to the clutch servomotor whereby initially when fluid



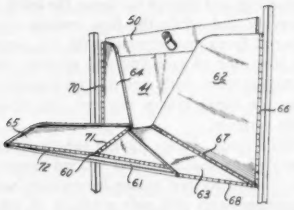
pressure is supplied from said source to said clutch servomotor, said pressure will engage said clutch and release said brake to provide drive to said driving element of the hydrodynamic device, and when said pressure from said source is exhausted, the charge pressure will act to engage said brake and release said clutch and thereby stop rotation of said driving element.

4,066,158

CHUTE CONSTRUCTION

William C. Hare, Chattanooga, Tenn., and Milton F. Collier, Orlando, Fla., assignors to Cumberland Corporation, Chattanooga, Tenn.

Filed Sept. 3, 1976, Ser. No. 720,386
Int. Cl.[2] B65G *11/12*
U.S. Cl. 193—34 **14 Claims**



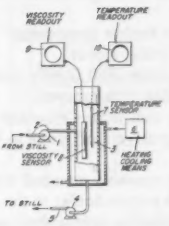
1. A storage chamber having walls and a door means to provide access thereto, and a chute structure for also providing access to said chamber comprising an aperture in one of said walls, a chute having a floor and side walls, said chute being hinged at the aperture in a manner to close the aperture when the chute is not in use and said chute receiving a package for delivery into said chamber when hinged to an open position, said chute gently dumping said package into said chamber when the chute is turned toward the closed position, said floor and walls of said chute precluding access into the storage chamber to retrieve a package once it has been dumped into the chamber, and said floor and walls of said chute being constructed and arranged to be folded and collapsed into a flat planar shape to be locked in place to close said aperture when said chamber is being loaded through said door means.

4,066,159

METHOD AND APPARATUS FOR THE CONTROL OF PITCH STILL OPERATION

George R. Romovacek, Monroeville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 383,152, July 27, 1973, abandoned.
This application July 30, 1975, Ser. No. 600,463
The portion of the term of this patent subsequent to Sept. 13, 1994, has been disclaimed.
Int. Cl.[2] B01D *3/42*
U.S. Cl. 196—132 **4 Claims**



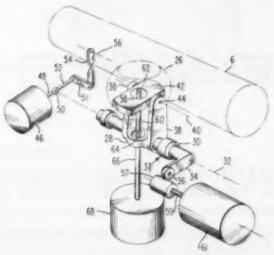
1. An apparatus for controlling the operation of a pitch still reactor comprising a means for removing a sample of pitch from the pitch still reactor, a sample chamber for holding a sample of the pitch, a means for heating the sample, a temperature sensing means and viscosity sensing means located within the chamber that cooperate to measure the temperature when the viscosity it at a preselected value and means for comparing the measured temperature with a predetermined value and controlling the parameters of the reaction in response to the comparison.

4,066,160

SINGLE ELEMENT IMPRINTING ASSEMBLY WITH INERTIALLY AND KINEMATICALLY INDEPENDENT MOTION CONTROLS

Kuo-Liang Lee, Northgate Apts., 109H, Cranbury, N.J. 08512

Filed Mar. 17, 1976, Ser. No. 667,781
Int. Cl.[2] B41J *1/60*
U.S. Cl. 197—18 **11 Claims**



1. A single element imprinting assembly with inertial and kinematic independent motion control means for use with a printing surface, which is movable with respect thereto, comprising:

a. a vertical selecting means comprising:
   1. a vertical selecting prime mover;
   2. a vertical selecting input shaft fixedly secured to said vertical selecting prime mover;
   3. a first coupling secured to said vertical selecting input shaft;
   4. a vertical selecting output shaft connected to said first coupling;

5. a bell crank fixedly secured to said vertical selecting output shaft; and
6. a connecting link connecting said bell crank to a single imprinting element tilt platform;

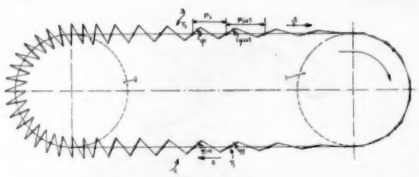
b. a rotational selecting means comprising:
1. a rotational selecting prime mover;
2. a rotational selecting input shaft fixedly secured to said rotational selecting prime mover;
3. a second coupling secured to said rotational selecting input shaft;
4. a rotational selecting output shaft connecting said second coupling to the single element imprinting rotation assembly; and

c. imprinting means further comprising:
1. an imprinting prime mover;
2. an imprinting drive shaft fixedly secured to the output of said imprinting prime mover;
3. an imprinting cam means mounted slidably keyed to said imprinting drive shaft so as to be rotatable therewith;
4. a rocker frame rotatably mounted with the axis of rotation positioned perpendicular to the axes of rotation of said vertical selecting output shaft, said vertical selecting input shaft, said rotational selecting output shaft and said rotational selecting input shaft; said rocker frame adapted to effect printing and including:
i. a crank arm and a cam follower secured to said crank arm to follow said imprinting cam means and be driven therefrom for imprinting; and
ii. a yoke means for holding a single element imprinting assembly.

4,066,161
CHAIN WITH LINKS OF VARIABLE LENGTH

Daniel Michalon, Saint-Etienne, and Pierre Rolin, Andreziux-Boutheon, both of France, assignors to Centre Stephanois de Recherches, Andrezieux-Boutheon, France

Filed July 2, 1974, Ser. No. 485,215
Claims priority, application France, July 2, 1973, 73.25015
Int. Cl.² B65G *65/06*
U.S. Cl. 198—334 **25 Claims**

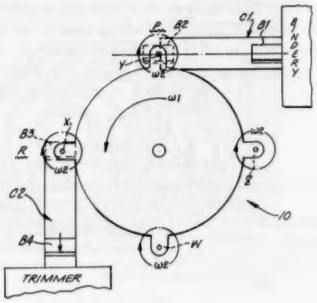


1. A variable-pitch chain-like conveyor, comprising, in combination:
a series of first transverse elements which move in a plane substantially parallel to a main path of travel and each of which is disposed substantially perpendicular to said main path of travel;
a series of second longitudinal elements each of which is movably connected through its central portion to one end of at least one of said first elements;
a series of third longitudinal elements, each of which interconnects directly one of said second elements to its adjacent second element in said series of second elements; and
means operably and mechanically connected to said series of second elements for varying the orientation of said second elements during movement of said conveyor.

4,066,162
ORBITAL TURN

Leonard Miaskoff, Easton, Pa., assignor to Harris Corporation, Cleveland, Ohio

Filed Nov. 28, 1975, Ser. No. 635,942
Int. Cl.² B65G *47/24*
U.S. Cl. 198—377 **1 Claim**



1. Apparatus for transferring a book having edges formed by the edges of the pages of the book and extending between first and second spaced substantially parallel side surfaces and at least one of the edges being bound, said apparatus being effective to transfer a book from a first conveyor on which the book is moved at a first speed with a first edge leading and the first side surface facing up and the second side surface facing down and in contact with the first conveyor to a second conveyor on which the book is moved at a speed substantially equal to said first speed of said first conveyor with another edge leading and the first side surface facing up and the second side surface facing down and in contact with the second conveyor, said apparatus comprising
first and second clamps for respectively engaging the first upwardly facing side surface and the second downwardly facing side surface of the book,
means for moving said first and second clamps into a position in alignment with said respective first and second side surfaces of the book while the book is moving and while the first edge thereof is leading,
means for guiding books between said clamps,
means for actuating said clamps to clamp the book while the book is moving and while the first leading edge of the book is spaced from engagement with any structure by moving at least one of said first and second clamps into clamping engagement with one of said parallel side surfaces while the other clamp engages the other of said parallel side surfaces,
said first and second clamps having substantially flat surfaces parallel to said first and second conveyors and being positioned by said means for moving said clamps into alignment with said side surfaces of the book to engage said second side surface facing down which contacted said first conveyor and said first side surface facing up,
means for continuously moving said first and second clamps and book clamped therebetween at a speed substantially equal to the speed of said first and second conveyors from a position adjacent to said first conveyor to a position adjacent to said second conveyor in a continuous fashion at a constant speed without accelerating or decelerating the book,
said means for continuously moving said first and second clamps and book while clamped therebetween to a position adjacent said second conveyor comprising means for rotating said clamps together about a second common axis parallel to a first common axis which extends transverse to said first and second parallel side surfaces and wherein said means comprises a pair of

vertically spaced parallel supports associated together for a joint rotation about said second common axis and wherein said one clamp is carried by one of said supports and said other clamp is carried by the other of said supports, said other clamp being supported by said other support by a bearing means enabling said clamp to be rotated freely relative to said other support about an axis centrally located relative to said other clamp and which axis comprises said first common axis,

said guide being interposed between said first and second supports and extending parallel thereto for guiding a book between said clamps,

means for releasing the book for deposit on said second conveyor when the book is positioned adjacent thereto and while the book and said clamps are moving,

said means for releasing adapted to oppositely move the flat parallel surfaces of said clamps to release and align the book on said second conveyor with another edge leading and the second side surface facing down and in contact with the second conveyor,

means for supporting said first and second clamps for rotation about said first common axis, and

means for continuously rotating said first and second clamps about said first common axis while said book is clamped therebetween to effect a continuous rotation of said book continuously and simultaneously while being moved between said first and second conveyors to orient the book with the second edge thereof leading when conveyed on said second conveyor,

said means for rotating said first and second clamps about said first common axis comprises means for rotating said first clamp about said second common axis while rotating about said first common axis with a book between said clamps whereby said second clamp is likewise rotated about said second common axis,

said means for continuously rotating said first clamp about said first common axis upon rotation of said clamps around said second common axis comprises a series of gear members one of which is mounted on said first common axis and has its axis coaxial with said first common axis and another of which is mounted on said second common axis and which is driven from said first gear member upon rotation of said second gear member about said second common axis,

said series of gear members comprises first, second and third gear members meshing in succession, the first gear member meshing with said second gear member and said second gear member meshing with said third gear member, said first gear member being fixedly mounted against rotation and located coaxially with said second common axis, said second gear member being mounted for rotation on said first support such that as said first support is rotated about said second common axis said second gear member is driven around the first gear member, said third gear member being mounted coaxially with said first common axis, and means connecting said one clamp member to said third gear member for rotation therewith about said first common axis.

4,066,163

ROW FORMER FOR ARTICLES

Edward F. Rowekamp, Cincinnati, Ohio, assignor to The Lodge & Shipley Company, Cincinnati, Ohio

Division of Ser. No. 502,039, Aug. 30, 1974, abandoned. This application Oct. 23, 1975, Ser. No. 624,866

Int. Cl.[2] B65G *47/26*

U.S. Cl. 198—442 **5 Claims**

1. Apparatus for forming a single file of articles into multiple files comprising,

a single file conveyor,

a multiple file conveyor having multiple lanes downstream of said single file conveyor,

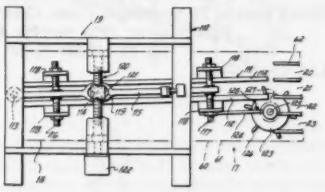
an elongated guide overlying said single file conveyor and pivoted at its upstream end for swinging in a horizontal plane,

the downstream end of said guide swinging adjacent the upstream end of said multiple file conveyor,

means for positioning the downstream end of said guide adjacent any of said multiple lanes,

a wheel mounted on said guide for rotation about a vertical axis, said wheel being normally freely rotatable,

a plurality of lugs circumferentially spaced about the periphery of said wheel and projecting into the path of articles passing through said guide,



means for braking said wheel to block the flow of articles as said guide shifts from one lane to another,

said means for positioning the downstream end of said guide comprising,

a screw mounted over said guide and extending transversely to said single file conveyor,

a block threaded on said screw,

a roller depending from said block,

a longitudinal slot in said guide receiving said roller,

and a stepping motor for rotating said screw in either direction.

4,066,164

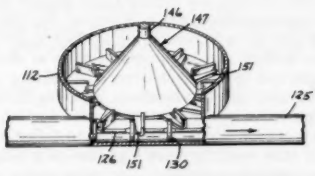
FEEDING MECHANISM FOR GRANULAR MATERIAL

Harlan J. Easton, R.F.D. No. 3, Blooming Prairie, Minn. 55917

Filed Dec. 19, 1975, Ser. No. 642,578

Int. Cl.[2] B65G *47/18*

U.S. Cl. 198—616 **2 Claims**



1. In combination:

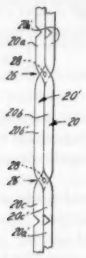
A conveyor comprising a cable, a plurality of circular flights secured to said cable at spaced intervals therealong, a tube, having an inside diameter substantially the same as the diameter of said flights, through which said cable passes, and driving and idler wheels for said cable spaced beyond the ends of said tube;

a bulk container for granular material having an upwardly concave, generally conical bottom and a central discharge chamber of reduced size located below and opening into said bottom and including a peripheral discharge orifice of limited area opening downwardly into said tube;

a feed mechanism including a vertical central shaft passing upward to terminate within said chamber, an impeller carried by said shaft and including a plurality of peripherally located spaced radial blades for displacing material in said chamber to said peripheral opening for discharge therethrough, an upwardly convex conical center for guiding loose material in said chamber outwardly to the blades of said impeller, and means actuated by said drive

shaft for preventing bridging and agglomeration of said material in said chamber;
a source of driving power;
and means connecting said source to actuate said conveyor, the linear spacing of said flights on said cable being an integral multiple of the peripheral spacing of said blades around said impeller, and said blades projecting partially through said discharge orifice to engage said flights and drive said impeller from the conveyor.

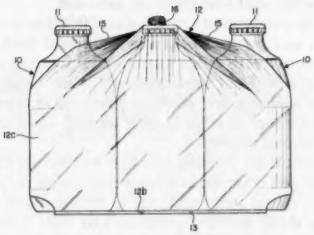
4,066,165
STAPLES AND PRODUCTION METHODS
Henry Ruskin, 21 Nomahegen Court, Cranford, N.J. 07016
Filed June 10, 1976, Ser. No. 694,897
Int. Cl.² B65D *85/24*
U.S. Cl. 206—340 **19 Claims**



1. The method of making staples, including the steps of modifying sheet metal to define the outlines of a succession of staples, the modification including the step of forming parallel grooves defining at least part of the lateral margins of the staples, shifting successive first, second and third portions of each defined staple in opposite directions out of the plane of the sheet metal while shifting the first, second and third portions of each staple in opposite directions in relation to the first, second and third portions, respectively, of its neighboring staples sufficiently to part the relatively shifted portions and leaving neighboring staples connected to each other at only two grooved locations situated respectively between said first and second portions and between said second and third portions of each neighboring pair of staples, the first, second and third portions of each staple being so close to one another that relatively shifting the neighboring staples as aforesaid leaves each staple and its neighbor connected only by grooved and twisted metal at said two locations, restoring lateral alignment of the respective portions of successive staples, and making two bends in each said second portion to define a crown and a pair of at least partially erect legs extending from the crown with the connections between successive staples located along the legs thereof.

11. A row of metal staples, each staple and the next in the row having elongated lateral surfaces substantially in abutment with each other but disconnected from each other, each staple and the next in the row having a crown and a pair of legs extending from the ends of the crown at least partially erect therefrom; and having one localized integral connection interrupting said lateral surfaces of each leg of each staple and corresponding legs of the neighboring staples, said row of staples being formed by the method including the steps of modifying sheet metal to define the outlines of a succession of staples, the modification including the step of forming parallel grooves defining at least part of the lateral margins of the staples, shifting successive first, second and third portions of each defined staple in opposite directions out of the plane of the sheet metal while shifting the first, second and third portions of each staple in opposite directions in relation to the first, second and third portions, respectively, of its neighboring staples sufficiently to part the relatively shifted portions and leaving neighboring staples connected to each other at only two grooved locations situated respectively between said first and second portions and between said second and third portions of each neighboring pair of staples, the first, second and third portions of each staple being so close to one another that relatively shifting the neighboring staples as aforesaid leaves each staple and its neighbor connected only by grooves and twisted metal at said two locations, restoring lateral alignment of the respective portions of successive staples, and making two bends in each said second portion to define a crown and a pair of at least partially erect legs extending from the crown with the connections between successive staples located along the legs thereof.

4,066,166
BOTTLE MULTIPACKAGE
Mindaugas Julius Klygis, Barrington, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Sept. 16, 1976, Ser. No. 723,827
Int. Cl.² B65D *75/56, 65/38, 85/62*
U.S. Cl. 206—427 **17 Claims**



1. A multipackage of a group of containers and a bag-like device, said group of containers arranged in two adjacent rows and in transverse ranks perpendicular to said rows, each of said containers having a capped upper end of a smaller diameter than the lower body portion thereof, said bag-like device having integral bottom and side walls formed of a thin flexible material substantially enveloping and in stretched engagement with the bottom and the outer side peripheral surface of said group of containers, the upper end of said bag-like device on the upper end of two opposed sidewalls thereof being gathered and stretched about the upper portions of said containers and secured in the area of the tops of said containers forming secured tensioned truss elements, said truss elements extending diagonally from opposite corners of said group of containers and being sufficiently tensioned between said opposite corners to substantially prevent skewing of said group of containers out of said transverse ranks perpendicular to said rows, and two opposed sides of said truss elements in the area of their securement being of reduced cross section and circumferentially open to form a handle element capable of being encircled by a person's finger.

4,066,167
RECLOSEABLE PACKAGE
Ward T. Hanna, Palatine, Ill.; John J. Drennan, Cincinnati, Ohio, and John T. Staroska, La Grange, Ill., assignors to Keebler Company, Elmhurst, Ill.
Filed July 8, 1976, Ser. No. 703,614
Int. Cl.² B65D *33/18*
U.S. Cl. 206—627 **5 Claims**

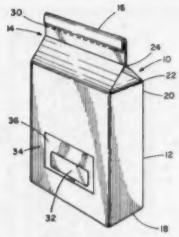
1. A recloseable package having a sealed state, an open state and a closed state, said reclosable package comprising, in said sealed state:
a bag portion having a closed end and an open end;
a closing portion joined to said bag portion at said open end, said closing portion including a tapered section adjacent said bag portion and a flap section, said flap section being

tackily sealed in said sealed state to define a sealed flap area;

a seal portion joined to said flap section;

a perforation between said seal portion and said closing portion to facilitate separation and removal of said seal portion, said sealed flap area being between said tapered section and said perforation;

an adhesive strip attached to said reclosable package in an inoperative position;



said reclosable package being operable in said open state whenever said seal portion is separated from said flap section and discarded and said sealed flap area is opened;

said flap section being foldable upon said tapered section in said open state to define a folded position;

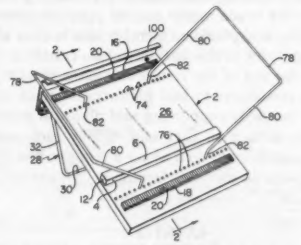
said reclosable package being operable in said closed state whenever said flap section is placed in said folded position, said adhesive strip is removed from said inoperative position, and said adhesive strip is attached to said reclosable package in an operative position to maintain said flap section in said folded position.

4,066,168

REFERENCE MANUAL STAND

Jerome O'Toole; David M. Wright, both of Shrewsbury, and Norman A. Hedstrom, Worcester, all of Mass., assignors to Wright Line Inc., Worcester, Mass.

Filed Mar. 29, 1976, Ser. No. 671,390
Int. Cl.[2] A47B *19/00*
U.S. Cl. 211—4 **13 Claims**



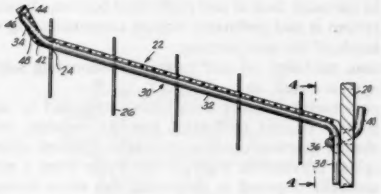
1. A book support for supporting a plurality of books in reading position, each of said books having a spine section with a hook, said support comprising a book support plate, means on said plate for interlocking with the hooks of said books, said means comprising a rib extending laterally of and attached to said plate, a flange carried by said rib and spaced from said plate, and a fin on said flange extending toward but spaced from said plate for making a snap fit with said hooks, rib, flange and fin forming an open channel extending for substantially the width of the plate so that books supported thereby may be placed at various positions along the channel, and additional means on said plate for interacting with the spine of said books so as to restrain said books against movement in a lateral direction.

4,066,169

BODIES TO BE ATTACHED TO SINGLE-PRONG HOOKS

Arthur Hochman, Union City, N.J., assignor to Art Phyl Creations, Newark, N.J.

Filed Aug. 24, 1976, Ser. No. 717,304
Int. Cl.[2] A47F *7/00*
U.S. Cl. 211—57.1 **10 Claims**



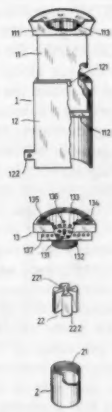
1. For use with a single-prong support hook having a front end, an elongated substantially rigid body adapted to rest at a lower surface thereof, which extends longitudinally along said body, on a single-prong support hook which is adapted to be connected at its rear end to and project forwardly from a carrying structure, with said body having a length sufficiently great to extend along the hook, in engagement therewith at said lower surface of said body and without clearance between said hook and body, forwardly from the carrying structure at least slightly beyond the front end of the hook, said body being of substantially rectangular transverse cross section and projecting laterally through a substantial distance on opposite sides of the single-prong hook while resting thereon, and said body having a fastening means for releasably fastening the body to a single-prong hook, carried by and projecting forwardly from a carrying structure, and for maintaining said body assembled with a single-prong hook while being supported thereby in a manner enabling the body together with the hook engaged thereby to be received in slots formed in packages which are to be displayed.

4,066,170

ON-WALL UMBRELLA HOLDER

Yueh Huang, Taipei Hsien, China /Taiwan, assignor to Lee Hon Corporation, Taipei Hsien, China /Taiwan

Continuation-in-part of Ser. No. 690,002, May 26, 1976, abandoned. This application Mar. 4, 1977, Ser. No. 774,488
Int. Cl.[2] A47G *25/12*
U.S. Cl. 211—63 **3 Claims**



1. A wall-mountable umbrella holder comprising:

a hollow, essentially tubular casing having an opening at an

upper end and a perforated pan-like member connected at the lower end for receiving and supporting a collapsed umbrella, said pan-like member including a perforated bottom, a side wall having a double-walled portion defining a gap between the two walls for engaging the lower end of the tubular casing and a perforated lower portion connected between said double-walled portion and said perforated bottom, and a hollow stud portion connected to the outer face of said perforated bottom, all said perforations in said perforated bottom communicating with the inside of the stud portion;

means, provided on said casing, for mounting said casing against a wall; and

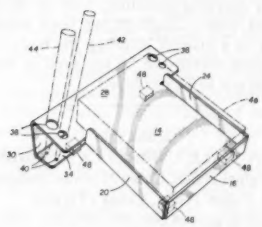
a cup-shaped member detachably connected to said stud portion of said perforated pan-like member, said cup-shaped member containing therein a bladed element for splash prevention, whereby the water from a moistened umbrella disposed in the casing can drain through said perforations in said pan-like member into said cup-shaped member for ready removal, and whereby air can flow through the perforations in the perforated lower portion of said side wall of said pan-like member to dry the inside of the casing and the umbrella.

4,066,171

DESK STAND FOR HOLDING IN OPERATIVE POSITION POCKET CALCULATORS AND OTHER DESK-TOP ARTICLES

William J. C. Fowlie, 2129 SE. Ladd Ave., Portland, Oreg. 97214

Filed Feb. 17, 1976, Ser. No. 658,708
Int. Cl.[2] A47F *7/00*
U.S. Cl. 211—69.1 **1 Claim**



1. A desk stand for holding in operative position pocket calculators and other desk top articles, the desk stand comprising a single sheet of stiff, structural material shaped and bent along predetermined lines to provide:

a. a bed dimensioned to receive the articles,

b. upright peripheral flanges along the opposite sides and front end of the bed to retain the article thereon, and

c. a support foot comprising a substantially vertical connecting section extending downwardly from the rear end of the bed and a substantially horizontal reversely bent bottom section extending forwardly from the bottom end of the vertical connecting section, the front edge of the bed and the bottom section of the support foot serving to engage a desk top for support of the desk stand thereon, said support foot thereby inclining the bed upwardly and rearwardly at a predetermined angle of inclination,

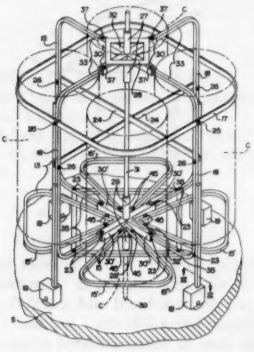
d. the vertical and horizontal sections of the support foot and the overlying rearward portion of the bed being extended laterally beyond the plane of at least one of the side flanges, the lateral extension of the rearward portion of the bed and the horizontal bottom section of the support foot having at least one pair of aligned guide-and-socket openings positioned for receiving and retaining a pencil, pen, or like pointed object, the opening in the lateral extension of the bed being sufficiently large to receive the body of the pointed object and the opening in the horizontal section of the support foot forming a retaining socket for the pointed end of the object.

4,066,172

MOBILE RACK FOR REFUSE CONTAINERS

Eddie Howard, 885 Shadowline Drive, Memphis, Tenn. 75126

Filed Feb. 17, 1976, Ser. No. 658,725
Int. Cl.[2] A47G *29/00*
U.S. Cl. 211—78 **12 Claims**



1. A mobile rack for supporting four refuse containers in upright positions said rack comprising:

a. a frame means including a platform member for restingly supporting the four refuse containers;

b. a substantially ring-like restraining means disposed in a substantially horizontal plane above said platform member for circumscribing and confining the four upright refuse containers;

c. a substantially cross-like brace means disposed in a substantially horizontal plane above said platform member for dividing the interior of said ring-like restraining means into four parts and for cooperating with said ring-like restraining means in confining the four upright refuse containers, each of said parts of said ring-like restraining means receiving one of the four upright refuse containers.

d. means for mounting said ring-like restraining means and said cross-like brace means to said platform member at a height above said platform member that is at or above the center of gravity of the upright refuse container and is at or below the top of the refuse container so as to confine the refuse containers to said platform member; and

e. means for movably supporting said platform member on a supporting surface so that said mobile rack may selectively be manually moved along a straight line and about a central point in carousel fashion.

4,066,173

APPARATUS FOR HIGH-SPEED ACCURATE COUNTING AND HANDLING OF DISCRETE OBJECTS SUCH AS TABLETS

Jim Mills Adams, West Caldwell, and Edward Francis deZabala, Pequannock, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

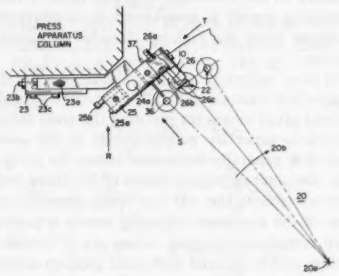
Division of Ser. No. 453,238, March 21, 1974, Pat. No. 3,997,063. This application Nov. 17, 1975, Ser. No. 632,438
Int. Cl.[2] G07F *11/00*
U.S. Cl. 214—1 C **15 Claims**

1. An ultra-accurate counting and handling system for use with high-speed press apparatus having a horizontally rotatable die table for making discrete, solid particular objects, comprising:

a. sensing means including a directional sensor arrangement predeterminably arranged relative to each station of the

apparatus at which the formation of the objects is virtually completed, each said sensor arrangement including a retro-reflective sensor arranged to have an operative face thereof proximate the said respective station of the apparatus at a pre-established optimum sensing angle α of between 18° and 30° relative to the horizontal and which is aimed at a point of the said respective station whereat the objects are substantially fully ejected from their dies;

b. control counter means responsive to said sensing means for providing a continuous count of the objects sensed by each said sensor arrangement, said counter means including first means enabling a presetting of the maximum desired count of sensed objects for each said station of the apparatus;



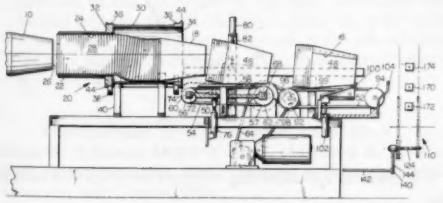
c. gating and handling means including a gated dispensing arrangement associated with each said station of the apparatus and having a first portion thereof situate proximate the said respective station, each said gated dispensing arrangement being adapted to predeterminably control the procession of the objects from said respective station of the apparatus to a pre-established destination under the supervision of said first means.

4,066,174

TRANSFER DEVICE FOR NESTABLE CONTAINER BODIES

Johnny Will Collins, Strafford, Mo.; Gunars Kochmanis, Uniondale, N.Y., and Bobby Ross Lynch, Ozark, Mo., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 21, 1977, Ser. No. 761,151
Int. Cl.² B65G *57/32*
U.S. Cl. 214—7 **7 Claims**



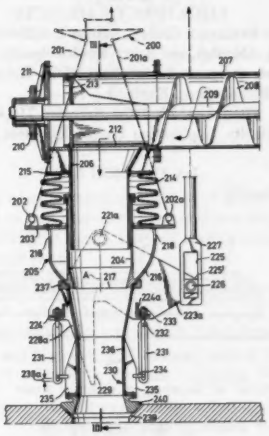
1. A bucket body transfer device comprising: a horizontally disposed rotatable drum having an open-ended accumulator section for receiving frustoconical bucket bodies and nestably accumulating them in a column, said accumulator section having a cylindrical inner surface, a separator section integrally connected to said accumulator section, said separator section having an enlarged openended cylindrical inner surface coaxially aligned with said accumulator surface, means for rotating said drum, and an offloading conveyor at the exit end of said separator section.

4,066,175

COKE-OVEN FILLING SYSTEM

Fritz Schulte, Meerbusch, Germany, assignor to Hartung, Kuhn & Co Maschinenfabrik GmbH, Dusseldorf, Germany

Filed Mar. 4, 1976, Ser. No. 663,985
Claims priority, application Germany, Mar. 7, 1975, 2510097
Int. Cl.² F27D *3/08*
U.S. Cl. 214—35 R **9 Claims**



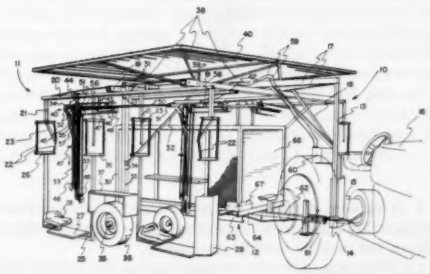
1. In combination with apparatus for loading coal into the charging hole of a coke oven, a filling system comprising an upper feed tube connected to said apparatus and adapted to receive coal therefrom; an intermediate upright tube vertically telescopable on said feed tube and having a lower end and pivots defining a horizontal axis; a seal connected between said intermediate tube and said feed tube and permitting relative telescoping therebetween; a lower tube suspended from said pivots of said intermediate tube and alignable with said intermediate tube and having a lower end sealingly engageable over said charging hole and an upper end sealingly engageable with said lower end of said intermediate tube; and means for displacing said lower tube out of alignment with said intermediate tube.

4,066,176

TOBACCO HARVESTER

Bass Honeycutt, Rte. 5, Clinton, N.C. 28328

Filed Feb. 25, 1976, Ser. No. 661,129
Int. Cl.² B65G *67/22*
U.S. Cl. 214—43 **8 Claims**



1. A crop harvesting system comprising: a self-supporting harvester unit for harvesting said crop; a self-supporting harvested crop transport unit for receiving said crop following

harvesting of the same, said harvester unit being separate and independent from and straddledly disposed about said transport unit whereby said transport unit can be removed and replaced without moving or affecting said harvester unit; and means for coordinatingly propelling said units across the field to be harvested whereby such harvesting can be readily accomplished.

4,066,177

LOCATION OF OBJECTS

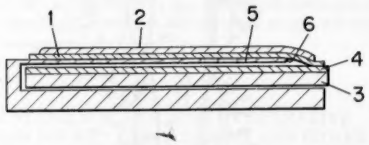
John Arthur Frederick Gidley, Sutton Coldfield; Barry Frederick Irving, Aldridge, and Barry Keith Johnson, Alum Rock, all of England, assignors to Imperial Metal Industries (Kynoch) Limited, Birmingham, England

Filed Aug. 23, 1976, Ser. No. 716,456

Claims priority, application United Kingdom, Aug. 26, 1975, 35203/75

Int. Cl.² B65G *61/00*

U.S. Cl. 214—152 **7 Claims**



1. A method of locating a flexible sheet of magnetisable metal having a tacky upper layer thereon onto a planar magnetic support which includes the steps of:

a. locating the planar magnetic support under a separating member, a portion of the planar magnetic support being exposed at the forward end thereof

b. advancing the magnetisable metal member forward over the edge of the separating member to come into contact with the forward edge of the planar magnetic support, and

c. advancing the planar magnetic support from beneath the separating member to draw the magnetisable metal member forward into further contact with the magnetic support.

4,066,178

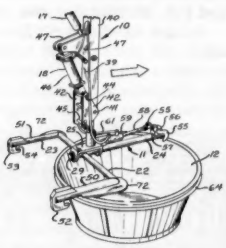
CONTAINER-DUMPING APPARATUS

William S. Carson, 218 Escambia Drive, Winter Haven, Fla. 33880

Filed July 21, 1976, Ser. No. 707,376

Int. Cl.² B65G *65/04*

U.S. Cl. 214—313 **12 Claims**



1. A pick-up assembly for a container dumping apparatus having a lift device for use in lifting and dumping round containers, the pick-up assembly including:

a. connecting means for connecting the pick-up assembly to the lift device,

b. three arms supported by the connecting means and extending therefrom,

c. container-engaging means on an end portion of each of the three arms, at least one of the container-engagin g means being movably mounted one the associated arm, the container-engaging means of the three arms being positioned in a circle having substantially the same diameter as the top of the round container and the spacing between each pair of container-engaging means being less than the diameter of the top of the round container, the arms extending from the connecting means in a manner which positions each of the container-engaging means relative to the connecting means so that the included angle between lines drawn from the connecting means to any pair of adjacent container-engaging means is less than 180°,

d. means for moving said one container-engaging means relative to the container whereby each of the container-engaging means is maintained in a container-engaging position when the pick-up assembly is raised by the lift device,

e. first pivot means for pivoting the three arms about a pitch axis which extends generally horizontally, and

f. second pivot means for pivoting the arms about a roll axis which is generally perpendicular to the pitch axis and which is generally horizontal when the plane defined by the container-engaging means of the three arms is generally horizontal, the roll axis being generally aligned with one of the container-engaging means whereby the other two container-engaging means are pivotable above and below said horizontal plane said pick-up assembly further including third pivot means for pivoting the three arms about a yaw axis which is generally perpendicular to both the pitch axis and the roll axis and which extends generally vertically when the plane defined by the container-engaging means of the three arms is generally horizontal whereby the arms can rotate relative to the lift device when the lift device is advanced toward a container and the container-engaging means on only one of the arms engages the container to bring the container-engaging means on the other of the arms into position to engage the container.

4,066,179

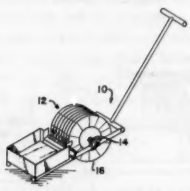
APPARATUS FOR COLLECTING OBJECTS FROM A SURFACE

Almer K. Livingston, Church St., Smithville, Ga. 31787

Continuation-in-part of Ser. No. 680,869, April 27, 1976. This application Aug. 26, 1976, Ser. No. 717,912

Int. Cl.² B60P *1/00*

U.S. Cl. 214—356 **12 Claims**



1. Apparatus for collecting objects from a surface comprising:

a frame;

means for grasping the objects on the surface including a plurality of elongated elastically deformable members carried by said frame for rotation about an axis substantially parallel to the surface, said members being circumferentially and axially spaced one from the other about said axis, each of said members carrying an enlarged element at the end thereof remote from said axis of rotation, said members being elastically deformable in axial and circumferential directions relative to their axis of rotation to grasp the objects and locate such objects substantially radially inwardly of said enlarged elements, said elements

precluding displacement of the objects in a radially outward direction upon further rotation of said members, said elastically deformable members having inner and outer portions, both of said portions being elastically deformable, said outer portion being capable of being deflected in response to a lesser force than necessary to deflect said inner portion to the same degree;

means carried by said frame for extracting objects from between said members upon rotation of said members about said axis, and

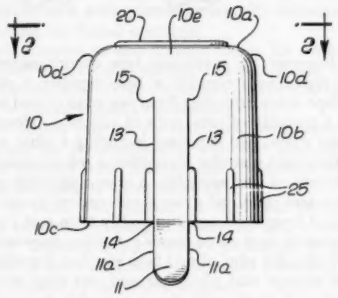
means carried by said frame for collecting the extracted objects.

4,066,180

FRANGIBLE CAP FOR BOTTLES

Alejandro C. Sanchez, 1531 N. Fuller, Hollywood, Calif. 90046

Filed Dec. 9, 1976, Ser. No. 748,747
Int. Cl.[2] B65D *41/52*
U.S. Cl. 215—254 **9 Claims**



1. A frangible sealing cap for a bottle neck, comprising:

a. a plastic cup having a top cover and a depending annular skirt, the cover and skirt having thin walls, the skirt being free of annularly outward bulge structure, said skirt and cover each having wall thickness between about 0.010 and 0.030 inches,

b. a plastic pull tab integral with the skirt and depending to a level below the lowermost level of the skirt, and

C. there being two weakening score lines extending into, but incompletely through the skirt from the outer surface thereof, said lines extending upwardly toward the top cover from points proximate the junctures of the skirt with opposite edges of the tab,

d. the skirt being thickened at circularly spaced locations to define narrow reinforcing protrusions which are elongated in directions toward the top cover and which stand outwardly from the outerside of the skirt, the protrusions confined to the lower half of the skirt, said score lines located adjacent two of said protrusions but at the inner sides thereof closest the main extent of the tab, whereby the skirt material between the score lines is uninterrupted by any of said protrusions.

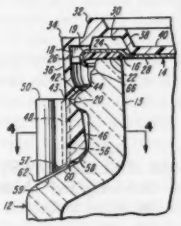
4,066,181

CONTAINER AND CLOSURE ASSEMBLY

William H. Robinson; David O. Allen, and Harry A. E. Wombold, all of Wilmington, Ohio, assignors to Buckeye Molding Company, New Vienna, Ohio

Filed Mar. 16, 1976, Ser. No. 667,290
Int. Cl.[2] B65D *41/32*
U.S. Cl. 215—256 **13 Claims**

1. In a closure for a container having a neck surrounding an opening initially sealed by a sealing means engaged to said neck, said neck having outwardly projecting annular bead means for retaining said closure: panel means for covering said opening and initially covering also said sealing means, and skirt means depending from said panel means for surrounding said neck, said skirt means having first attaching means engaging said bead means for attaching said closure to said container, said first attaching means including a tear strip severable from a remaining portion of said skirt means to disable said first attaching means and thereby permit removal of said remaining portion of said skirt means from said container and said sealing means and removal of said sealing means from said neck, said remaining portion of said skirt means having second attaching



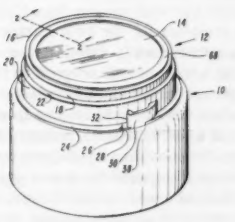
means engaging a lower margin of said bead means for attaching said closure to said container after said tear strip has been removed from said skirt means and said sealing means has been removed from said neck.

4,066,182

CONTAINER AND CLOSURE ASSEMBLY

David O. Allen, and Harry A. E. Wombold, both of Wilmington, Ohio, assignors to Buckeye Molding Company, New Vienna, Ohio

Filed Aug. 23, 1976, Ser. No. 716,975
Int. Cl.[2] B65D *41/46*
U.S. Cl. 215—256 **11 Claims**



1. In a closure for a container of the type having a neck surrounding an opening to the container, having a shoulder surrounding said neck and spaced from said opening, and having closure retaining means supported by said neck between said shoulder and said opening; said closure comprising means for covering said opening to said container and a skirt for surrounding said neck, said skirt having means for engaging said retaining means and a first score line spaced from the distal end of said skirt to define one side of a tear-away portion, said tear-away portion having a pull tab affixed thereto, the improvement wherein the distal end of said tear-away portion has a circular flange projecting radially outwardly therefrom and extending peripherally therearound, wherein said pull tab is located between said flange and said means for covering said opening, and wherein the outward extension of said pull tab does not exceed the outward projection of said flange.

4,066,183

CHROMATOGRAPHIC SEPTUM HAVING POLYIMIDE COATING

Nelson W. Armstrong, Hoffman Estates, Ill., assignor to L. C. Company, Inc., Schaumburg, Ill.

Filed Feb. 24, 1977, Ser. No. 771,689
Int. Cl.[2] B32B *3/02, 27/06, 27/28;* B65D *59/02*
U.S. Cl. 215—247 **4 Claims**

1. In a chromatographic septum comprising a body of hypo-

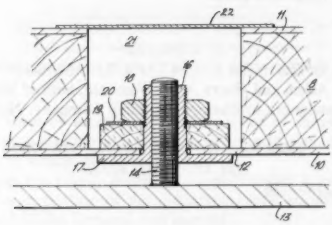
dermic needle penetrable self-healing rubber adapted to serve as a closure for a container or chromatographic system, the improvement which comprises covering the surface of the septum that is to be exposed to the interior of the container or system with a coating of polyimide polymer.

4,066,184

THERMAL INSULATION SYSTEMS

William Livingstone Cuthbert, and Thomas Brown, both of Mount Laurel, N.J., assignors to Conch L.N.G., Moorestown, N.J.

Filed July 13, 1976, Ser. No. 704,987
Int. Cl.[2] B65D *87/24;* B63B *25/16*
U.S. Cl. 220—9 LG **8 Claims**



1. (A). In a container for the bulk storage and transport of liquids at temperatures greatly differing from ambient temperature, comprising a storage tank adapted to hold a quantity of liquid, said tank surrounded and supported at least from below by thermal insulation which is (i) built up from a multiplicity of panels, (ii) sealed together and (iii) supported by a rigid outer shell, and means for providing a substantially level supporting surface for said panels spaced from said rigid outer shell, the improvement wherein said means for providing essentially comprises, (in place of wooden ground strips normally employed for such purpose):

a. upstanding studs rigidly fixed to the inner surface of said outer shell in a predetermined spaced relationship determined by the shape and size of said panels;

b. a fitting defining a seat mounted on each said stud, each fitting being capable of axial movement on its respective stud, said fitting comprising a sleeve defining a threaded bore for mating with a screw thread provided on said stud, and an external flange constituting said seat, axial adjustment of each sleeve being effected by appropriate rotation on its respective stud;

c. locking means for locking each said fitting in an adjusted position on its respective stud;

d. each edge of each panel defining an extended lip portion adjacent the outer face thereof;

e. said panels being supported in edge to edge relationship with said lip portion thereof located on said seats defined by said fittings, the latter being individually adjusted to provide a level supporting surface for said panels spaced from said outer shell;

f. first elongated sealing means located within the spaces defined between the edges of adjacent panels and bridging said lip portions of said respective edges to seal said outer faces of said panels;

g. filling means filling said spaces; and

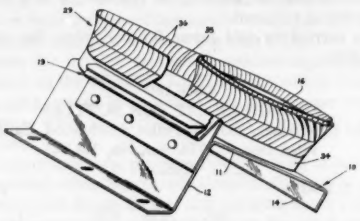
h. second elongated sealing means bridging the inner faces of adjacent panels to seal said spaces.

4,066,185

SPLICING TAPE ASSEMBLY AND DISPENSER THEREFOR

Wilmer B. Thompson, Rte. 1, Social Circle, Ga. 30279

Filed Mar. 22, 1976, Ser. No. 668,854
Int. Cl.[2] B65H *3/58*
U.S. Cl. 221—26 **9 Claims**



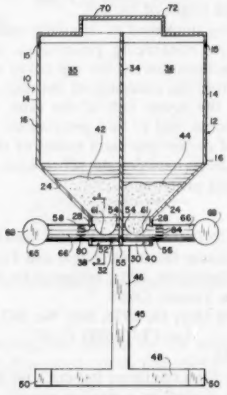
1. A dispenser for a splicing tape carrier assembly, said assembly including a continuous base member, a plurality of splicing tape strips extending from one edge of said base member, and a plurality of tabs, each of said tabs extending from one of said strips, said dispenser including a plate, a core extending from said plate for supporting a roll containing a continuous length of said assembly, a clamp assembly supported adjacent to said plate, and guide means carried by said plate for guiding said length of carrier assembly from said core to said clamp assembly, said guide means extending outwardly of said plate such that the edge of said base member opposite said one edge will engage said plate and said one edge extends outwardly of said plate, said clamp assembly having a throat located to receive said base member and including a clamp plate, a clamp jaw selectively movable towards and away from said clamp plate for selectively engaging said base member.

4,066,186

INSTANT COFFEE DISPENSER

Michael J. Agey, 6917 Security Squadron APO, NY, N.Y. 09240

Filed Oct. 13, 1976, Ser. No. 732,040
Int. Cl.[2] B67D *5/22*
U.S. Cl. 222—48 **3 Claims**



1. A dispenser for use in the home, office, or the like, comprising:

a. housing means including a pair of storage chambers for containing coffee or the like in one chamber, and sugar, powdered milk or the like in the other chamber, each chamber provided with a discharge funnel terminating in an opening,

b. said housing means includes:
1. a vertical partition wall forming said chambers,
2. said discharge funnel includes a pair of bottom walls in substantially parallel spaced relationship to said partition wall, each having a transversely extending aperture therein,
3. a pair of spaced apart side walls,
4. a pair of spaced apart end walls,
5. a pair of inwardly disposed spaced apart inclined side walls connected to said side walls at one end thereof forming part of said discharge funnel,
6. a pair of inwardly disposed spaced apart inclined end walls connected to said end walls at one end thereof forming part of said discharge funnel,
7. a pair of bottom side walls connected at one end thereof to said inclined side walls, and
8. a pair of bottom end walls connected at one end thereof to said inclined end walls, said bottom end walls and said bottom side walls forming the funnel bottom with said partition wall extending vertically therethrough for forming the funnel openings,

c. a stand coupled to said housing means for retaining said dispenser on a support surface and maintaining each said opening elevated above the support surface so that a cup may be placed beneath the openings,

d. valve means operatively associated with each of said openings for communicating with and dispensing a selected amount from each of said chambers, said valve means including a valve member individually and rotatably mounted with respect to each said opening, said valve member including a front end and a spherically curved depression for receiving therein a measured amount of material which is dispensed from said opening upon rotation of said valve member,

e. each said valve member has a circular cross-section extending through one of said apertures with said front end mounted in abutting relationship to said partition wall, an annular recess in each said valve member with said funnel wall extending in said recess to maintain said valve member in lateral fixed relationship to the funnel opening, and a valve seat provided adjacent each said funnel opening for receiving one said valve member therein for angular rotation thereof,

f. gripping means coupled to one end of each of said valve members and adapted to be gripped by the user of the dispenser for individual rotation of each valve member for dispensing material from each said chamber,

g. said gripping means being in axial alignment with each said valve member and including an enlarged head to facilitate gripping by a user of the dispenser, said valve members being in axial alignment with each other,

h. cover means removably secured to said housing means to permit access to said storage chambers.

i. viewing means operatively associated with said housing means to permit a viewing therein to determine the amount of material remaining in each of said chambers, and

j. calibration means associated with said valve means and said housing means to permit the user to gauge the degree of rotation of each valve member in order to dispense a selected quantity of material from each said chamber.

4,066,187

VALVE UNIT FOR LIQUID DISPENSERS

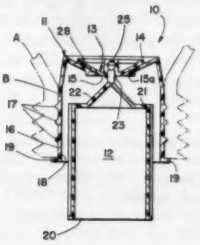
Charles Wayne Nieman, Burlingame; Robert Peter Turkovich, Foster City, and Robert Frank Castronovo, Belmont, all of Calif., assignors to Trident Products Inc., South San Francisco, Calif.

Filed Nov. 15, 1976, Ser. No. 742,008
Int. Cl.[2] E03D *9/03*
U.S. Cl. 222—57 **2 Claims**

1. A liquid dispenser unit for bottles containing liquids that has a positive seal for shipping comprising:

a cylindrical hollow bell means having an inwardly-directed conical surface closing one end with a central aperture therein and having an outwardly-directed radial flange around its mouth so it can be inserted into the cylindrical opening in the neck of a bottle in a manner allowing its radial flange to engage the distal end surface of the cylindrical opening, said bell means having raised encircling beads about its outer periphery operable to sealingly engage the neck of the bottle in which said bell means is inserted, and said inwardly-directed conical surface having a tapered wall allowing it to be deflected for improving sealing action about such central aperture;

a buoyancy cylinder means of a smaller diameter than said bell means having a conical crown means at one end terminating in a projecting shaft, said buoyancy cylinder assembled in said bell means so its shaft can reciprocate axially in said aperture of said bell allowing its conical surface to sealingly engage said aperture when said cylinder moves into said bell means, said buoyancy cylinder having an axial length greater than that of said bell means; and



a sealing cap means having a diameter greater than said aperture fixedly connected to the distal end of said shaft projecting through said aperture and also having a surface operable to engage the outer surface of said inwardly-directed surface of said cylinder whereby said cylinder due to its buoyancy will cause said conical surface to sealingly engage said aperture and loss of buoyancy thereon will cause said cap means to sealingly close off flow when the unit is in an environment of rising and falling water levels and liquid will be dispersed during the transit times between the two resulting sealing positions, said sealing cap having notches in its rim to effect turbulent flow therearound when it closes to improve its sealing action when it engages such central aperture in said hollow bell means.

4,066,188

THERMOPLASTIC ADHESIVE DISPENSER HAVING AN INTERNAL HEAT EXCHANGER

Charles H. Scholl, and Larry D. Akers, both of Vermilion, Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Aug. 10, 1976, Ser. No. 713,319
Int. Cl.[2] B67D *5/62*
U.S. Cl. 222—146 HE **6 Claims**

1. An adhesive dispensing apparatus for extruding hot viscous liquid from a pressurized source onto a substrate surface, comprising:

a body having a central bore formed therethrough;

a passage means in said body connected to said central bore for conducting viscous liquid to said central bore;

a valve seat attached to one end of said central bore;

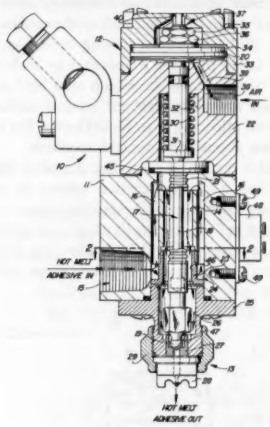
a movable valve assembly disposed in said central bore for operative engagement with said valve seat;

a passageway formed in said valve seat;

said valve assembly operatively controlling the flow of said viscous liquid through said passageway in said valve seat;

heater bores formed in said body adjacent to said central bore with heating means disposed therein; and

a plurality of parallel bores formed in said body between said heating means and said central bore, which plurality of parallel bores are concentrically disposed around said valve assembly, and wherein the parallel bores function as heat exchanger means



4,066,189

APPARATUS FOR CONTROLLED INJECTION OF A MOLTEN MATERIAL UNDER PRESSURE

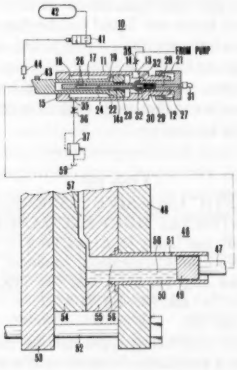
Ueno Toyoaki, Yoshiki; Takayama Seizo, Ube; Hashimoto Kiyoshi, Ube, and Uchida Masashi, Ube, all of Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Jan. 28, 1976, Ser. No. 653,028

Claims priority, application Japan, Jan. 31, 1975, 50-13045; Jan. 31, 1975, 50-13046; Feb. 5, 1975, 50-14383; Feb. 5, 1975, 50-14384; Mar. 4, 1975, 50-25585; Mar. 4, 1975, 50-25586

Int. Cl.[2] B22D *39/00*

U.S. Cl. 222—334 **18 Claims**



5. An injection apparatus for use in an injection molding system comprising an injection cylinder having an inlet port and an outlet port adapted to selectively permit the flow of a liquid into and out of said cylinder, said injection cylinder further having first and second ends with a piston slidably disposed therein and extending out of said first end thereof, and a hollow tube coupled to said piston and extending out of said second end of said injection cylinder, said hollow tube having at least one port and said piston having blocking means for blocking off each said port on said hollow tube as said piston slides in said cylinder whereby as liquid is caused to flow into said injection cylinder through said inlet port, said piston is caused to slide in said cylinder said liquid being initially permitted to flow through each said port on said hollow tube and is then prevented therefrom as each said port engages said blocking means.

4,066,190

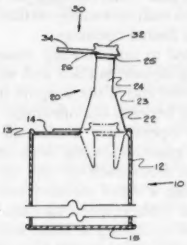
CONTAINER WITH COLLAPSIBLE POURING SPOUT AND IMPROVED RECLOSING MEANS

Walter K. Chlystun, 327 St. James Drive, Spartanburg, S.C. 29301

Continuation of Ser. No. 630,509, Nov. 10, 1975, which is a continuation of Ser. No. 420,964, Dec. 3, 1973, abandoned. This application Sept. 20, 1976, Ser. No. 725,099

Int. Cl.[2] B67D *3/00*

U.S. Cl. 222—529 **10 Claims**



1. A resealable dispensing container comprising:

a. a container body;

b. a dispensing spout secured to said body;

c. a cover integral with said dispensing spout and removable therefrom, said spout having a weakened tear line thereabout, severance of which separates said cover from said spout to permit dispensing from said spout;

d. said spout further having an enlarged area adjacent said tear line; and

e. said cover having an inner annular section adjacent the upper end thereof that is mateable with said enlarged area in a snap fit relationship whereby said cover can be replaced over said spout to reseal said container, said annular section being defined by concentric walls, an outside of said concentric walls having an inwardly projecting shoulder thereon defining a bottom of said section.

4,066,191

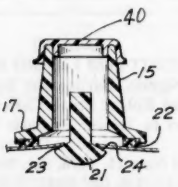
DRINKING AND POURING SPOUT FOR USE WITH EASY-OPENING CONTAINERS

Kenneth L. Coleman, 715 W. Gordon Terrace, Chicago, Ill. 60613

Filed Oct. 18, 1976, Ser. No. 733,448

Int. Cl.[2] B65D *5/74, 25/00*; A47G *19/22*

U.S. Cl. 222—569 **5 Claims**



1. A pouring and drinking spout adapted for sealed engage-

ment with the mouth of an easy-opening container comprising, in combination,

a substantially cylindrical, hollow barrel defining a ring-shaped bearing surface at one end thereof,

a resilient sealing washer attached to said bearing surface, and

a flared camming member supported at the axis of said barrel outwardly of said bearing surface for engaging with the interior edges of the mouth of said container as said barrel is turned with respect thereto to hold said sealing washer in sealed engagement with the surface of said container.

4,066,192

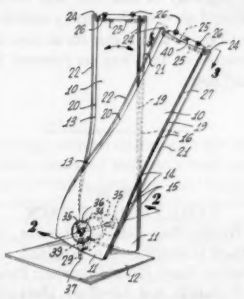
DISPLAY FORM FOR PANTS

Morris A. Wolf, 7048 Macapo Drive, Los Angeles, Calif. 90068

Filed Dec. 10, 1976, Ser. No. 749,528

Int. Cl.[2] D06C *15/00*

U.S. Cl. 223—72 **12 Claims**



1. A pants display form comprising a pair of three-dimensionally contoured leg-and-hip simulating members for insertion in a pair of pants and each having front and back edges, elongated, flexible expansion elements extending along the edges of said simulating members and spaced from said simulating members throughout at least a substantial portion of their lengths, and means for holding said expansion elements away from said simulating members to pull pants taut across the contours of said leg members, comprising an extension at one end of each of said expansion elements, and means for securing each of said extensions to one of said simulating members to hold said expansion elements at adjustable distances from said simulating members.

4,066,193

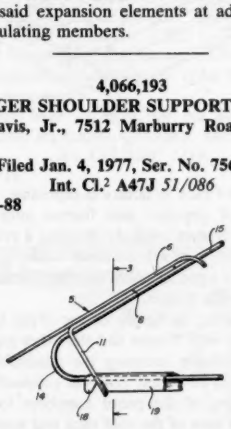
COAT HANGER SHOULDER SUPPORT ATTACHMENT

George B. Davis, Jr., 7512 Marburry Road, Bethesda, Md. 20034

Filed Jan. 4, 1977, Ser. No. 756,684

Int. Cl.[2] A47J *51/086*

U.S. Cl. 223—88 **9 Claims**



1. A shoulder supporting attachment for attaching to a conventional bent wire coat hanger having sloping garment shoulder supporting surfaces connected by curved end portions to a horizontal cross-member said supporting attachment comprising, a shoulder supporting first plate having first and second ends with said first end for mounting over and extending beyond the curved end portion of the hanger, means forming a second plate secured to and forming an integral part of said first plate and including a free portion having therein a transverse crease line inwardly of said first end and a portion manually ingagable to facilitate the bending of said free portion from said first plate at said crease-line, means forming an elongated slit extending through said free portion for receiving therein the curved end of said hanger with the sides of said slit being operative to frictionally grip the sides of said hanger as the curved end portion of the hanger is forcefully inserted to seated position within said slit to form by said slitted free portion a first securing means for fastening said attachment to said hanger, means forming a second securing means extending from the integral portion of said plates at the second end thereof and manually movable into locking engagement with the sloping garment supporting surface of said hanger and cooperative with said first securing means to maintain said shoulder supporting attachment mounted over the curved outer end portion of said hanger, said first and second securing means, when free of said hanger, being movable to a position substantially coplanar with the integral portion of said plates whereby the attachment may be compacted into a substantially flat assembly for stacking one upon the other for advantageous packaging shipping and handling.

4,066,194

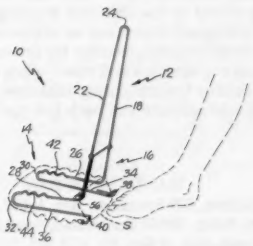
SOCK DONNING ASSIST DEVICE

Ragnvald G. Leland, P.O. Box 4174, Palm Springs, Calif. 92262

Filed Apr. 29, 1977, Ser. No. 792,415

Int. Cl.[2] A47J *51/06*

U.S. Cl. 223—111 **15 Claims**



1. A device for assisting in the donning of a foot covering, which comprises:

handle means including a pair of laterally spaced, elongated frame members;

insert means extending integrally from said handle means and adapted to be placed within a foot covering for spreading same; and

means connected to said handle means for releasing said foot covering which comprises means releasably connected between said pair of laterally spaced, elongated frame members for releasably maintaining same in a fixed, spaced position.

4,066,195

LOCKING MECHANISM FOR TAMPER-PROOF BACKPACK OR PIECE OF LUGGAGE

Paul J. Dickler, 37 W. 8th St., New York, N.Y. 10011

Continuation-in-part of Ser. No. 436,491, Jan. 25, 1974, Pat. No. 3,960,300. This application Oct. 14, 1975, Ser. No. 621,870

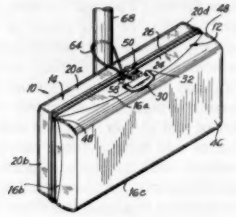
The portion of the term of this patent subsequent to July 1, 1993, has been disclaimed.

Int. Cl.[2] A45F *3/04*

U.S. Cl. 224—8 R **9 Claims**

1. A piece of luggage comprising a body having side walls

and a rear wall defining a space for storing material, a cover connected to one of said side walls and adapted to swing from a closed position to an open position providing access to said storage space, locking means for securing said cover to said body in its closed position, and means for securing said piece of luggage to a stationary object, said stationary object securing means including a well defined in one of said side walls, said well including an aperture opening to said storage space, a securing member having a first end permanently maintained within said storage space exterior of said well and having a second end inserted in said well through said aperture, a cover for said well permanently connected to said piece of luggage and adapted to move from a closed position to an open position, said well cover and said well defining a notch for enabling said securing member to extend from said well when said well cover is closed, wherein said second end of said securing member is adapted to be withdrawn from said well when said well cover is opened with said securing member sliding through said aperture, said securing member being wrapped around said stationary object and said second end of said securing member being reinserted back into said well and said well cover being closed to maintain said securing member looped around said stationary object, and an abutment disposed at said second end of the securing member for preventing withdrawal of said second end through said notch when said well cover is closed and further for preventing withdrawal of said second end through said aperture and back into the storage space.



4,066,196

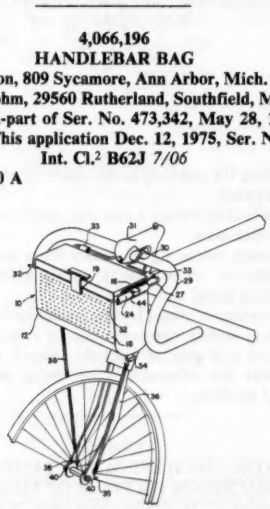
HANDLEBAR BAG

W. Shaun Jackson, 809 Sycamore, Ann Arbor, Mich. 48104, and Leslie Eric Bohm, 29560 Rutherland, Southfield, Mich. 48076

Continuation-in-part of Ser. No. 473,342, May 28, 1974, Pat. No. 3,955,728. This application Dec. 12, 1975, Ser. No. 640,070

Int. Cl.[2] B62J *7/06*

U.S. Cl. 224—30 A **19 Claims**



1. An article carrier that is supported forward of the handlebars of a cycle comprising:

a frame comprised of a single elongated section having a apir of rigid parallel spaced end sections and having a central section adapted to extend under and bear against the upper stem of said handlebars and also extending over the upper surface of said handlebars to be supported on said upper surface, said frame further including a pair of laterally diverging segments, one each connecting each of said end sections with a respective portion of said central section extending over said handlebar, said end sections extending forwardly from the handlebars, on opposed sides of the steering post, in a generally horizontal attitude when said frame is positioned on said cycle; and,

a closed bag dimensioned to fit between said end sections formed of a flexible sheet material and having openings formed on the sides of said bag adapted to slidably receive said end sections to enable mounting of said bag onto said frame;

fastening means securing said bag against longitudinal displacement on said end sections;

an access opening formed in said bag intermediate said end sections when said bag is mounted on said frame; and

closure means associated with the opening,

whereby said bag may be slid onto said frame between said end sections and secured thereto by said fastener means to support said bag on said frame on at least two sides of the upper perimeter of said bag to prevent buckling of the edges of said bag.

4,066,197

VEHICLE ROOF RACK

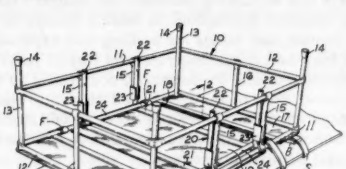
William Harry Nobbs, Bury; Harold Bowker, and Peter Frank Tyburski, both of Radcliffe, all of England, assignors to William Harry Nobbs, Bury; Harold Bowker; Peter Frank Tyburski, both of Radcliffe and Geoffrey Hesketh, Bury, all of, England, part interest to each

Filed June 17, 1976, Ser. No. 696,943

Claims priority, application United Kingdom, Aug. 9, 1975, 33293/75; Dec. 10, 1975, 50553/75

Int. Cl.[2] B60M *9/04*

U.S. Cl. 224—42.01 **9 Claims**



1. A vehicle roof rack structure comprising:

a framework of opposed side frames interconnected by opposed end frames unisonly forming a rectangular box-like configuration of side and end walls,

a base formed by a pair of panel members extending between the opposed side frames,

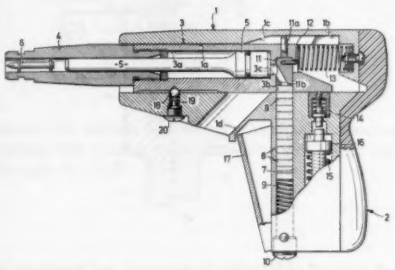
means for adjusting the height of one of the panel members relative to the side frames and the other panel member,

means for selectively securing the adjustable one of the panel members in a first position substantially coplanar with the other of the panel members for constituting therewith the base of the roof rack and upon inversion of the framework in a second position raised relative to the other of the panel members for constituting therewith a combination table and seating unit, and means for attaching the framework to the vehicle roof when the adjustable one of the panel members is in its first position.

4,066,198
FASTENING ELEMENT SETTING GUN WITH AN EJECTION MEMBER

Peter Jochum, Meiningen, Austria, and Hans Dieter Seghezzi, Vaduz, Liechtenstein, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Mar. 29, 1976, Ser. No. 671,152
Claims priority, application Germany, Apr. 1, 1975, 2514238
Int. Cl.[2] B25C *1/14*
U.S. Cl. 227—8 12 Claims

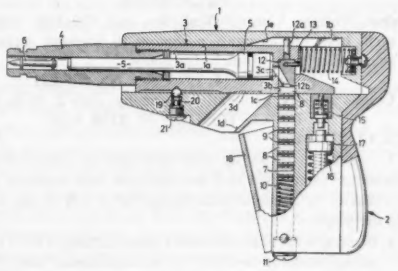


1. Explosive charge driven setting gun for driving fastening elements into hard receiving materials such as steel, concrete and the like, comprising a gun housing, magazine means for feeding caseless propellant charges within said housing, means movably displaceable within said housing including at least one firing chamber with said firing chamber being movable between spaced positions including a loading position for receiving a caseless charge from said magazine means, a firing position for igniting the charge within said firing chamber and an ejecting position for clearing said firing chamber, wherein the improvement comprises that said movably displaceable means includes an ejecting member positioned adjacent the location of said firing chamber in the ejecting position and arranged to be moved through said firing chamber for clearing the chamber, and said ejecting member having a cross sectional shape transverse to its direction of movement through said firing chamber which is substantially the same as the cross sectional shape of said firing chamber in the same transverse direction.

4,066,199
EXPLOSIVE CHARGE FEED ARRANGEMENT FOR A SETTING GUN

Peter Jochum, Meiningen, Austria, and Hans Dieter Seghezzi, Vaduz, Liechtenstein, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Mar. 23, 1976, Ser. No. 669,491
Claims priority, application Germany, Apr. 1, 1975, 2514239
Int. Cl.[2] B25C *1/14*
U.S. Cl. 227—10 17 Claims

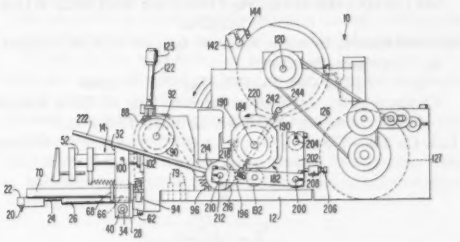


1. Explosive charge driven setting gun for driving fastening elements into a hard target material, comprising a gun housing including a handle, a firing mechanism within said housing, a magazine duct within said housing arranged to receive a plurality of alternating caseless charges and spacers and having an outlet opening spaced from said firing mechanism through which caseless charges can be removed from said magazine duct, means movably displaceable within said gun housing and including a receiving recess displaceable between a first position in alignment with the outlet opening from said magazine duct and a second position juxtaposed to said firing mechanism so that a caseless charge can be received from said magazine duct in the first position of said receiving recess and then moved to the second position for ignition by said firing mechanism, wherein the improvement comprises that said means include ejector means for displacing a spacer from the outlet opening from said magazine duct after the caseless charge immediately preceding the spacer has been displaced into said receiving recess from said first position, into a position for displacing said spacer out of said gun housing as said means moves from the second position to the first position.

4,066,200
DIE PLACEMENT TOOL OR THE LIKE

John C. Diepeveen, 1737 Kimberly Drive, Sunnyvale, Calif. 94086

Continuation of Ser. No. 537,523, Dec. 30, 1974, Pat. No. 4,019,668. This application Mar. 22, 1976, Ser. No. 669,056
The portion of the term of this patent subsequent to Apr. 26, 1994, has been disclaimed.
Int. Cl.[2] H01L *21/60*
U.S. Cl. 228—3.1 2 Claims



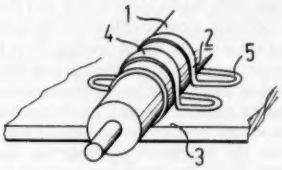
1. A transfer mechanism comprising: a support; a holder for a device to be moved from a first location to a second location spaced from said first location; means on the support and coupled with the holder for mounting the latter for substantially rectilinear up and down movement relative to the support, whereby the holder can move toward and away from either of said locations when the same is vertically aligned therewith, said holder being carried on said mounting means for substantially rectiliner fore and aft movement relative to said support, whereby the holder can move between respective positions vertically aligned with and spaced from said locations; means coupled with the mounting means for moving the holder toward and away from a location vertically aligned therewith; means coupled with the holder for shifting the same relative to said mounting means and between said positions; means biasing the holder in one direction extending longitudinally of its path fore and aft movement; a pivotal shaft carried by the support; a pusher arm secured to and extending laterally from the shaft, the outer end of the arm engaging the holder when the latter is in one of said positions; a lever coupled to said shaft, there being an inclined surface on said support adjacent to the lever; means on said lever for engaging said inclined surface; and means coupled with the lever for moving the latter and thereby said surface-engaging means thereof relative to said inclined surface to thereby pivot said shaft to cause said holder to be reciprocated relative to the support.

4,066,201

METHOD OF JOINING METAL PARTS

Richard Bleckmann, Imbergstrasse 24, Salzburg, Austria

Filed Nov. 10, 1976, Ser. No. 740,737
Int. Cl.[2] B23K *21/00*
U.S. Cl. 228—115 **16 Claims**



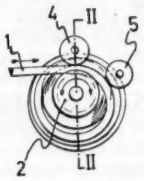
1. A method of cold-joining metal parts together comprising the steps of providing at least one metal part having a substantially tubular shape, providing a metal part which is substantially flat, providing a structure formed of wire wherein wire portions of said structure are disposed substantially parallel one to another, positioning said wire structure into contact with said tubular part such that said wire portions are substantially perpendicular to the length of said tubular part, compressing said tubular part and said wire structure together to form a bonded relationship, positioning the bonded together parts in contact with said flat part, and fastening said structure formed of wire onto said flat part.

4,066,202

METHOD FOR MAKING TUBULAR WELDED WIRE SCREENS

Edouard Binard, Brussels, Belgium, assignor to N. V. Bekaert S. A., Zwevegem, Belgium

Filed Oct. 14, 1976, Ser. No. 732,546
Claims priority, application Belgium, Feb. 10, 1976, 838396
Int. Cl.[2] B23K *31/02*; B21F *15/08*
U.S. Cl. 228—173 E **5 Claims**



1. A method for making cylindrical welded wire screens comprising:

a. continuously bending a wire into a helical wrap so as to form juxtaposed equal wraps substantially free of residual bending stresses, each of said wraps having a diameter substantially equal to the desired finish diameter of the cylindrical screen and whereby the radius of curvature imparted to the wire during the bending step is smaller than the radius of the formed wraps, said continuous bending being performed inside the outer circumference of the wraps,

b. supporting said formed wraps and progressively guiding said formed wraps and bringing successive points of said formed wraps into contact with a plurality of supporting wires extending in the contact area substantially parallel to the generatrix of the cylindrical screen thereby substantially equally spacing successive connecting points of the wraps with the same supporting wire, and

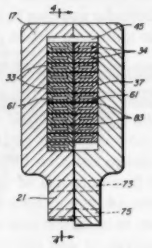
c. connecting successive contact points of said wraps with said supporting wires by welding.

4,066,203

METHOD FOR ELECTRICALLY AND HYDRAULICALLY CONNECTING A WATER-COOLED CONDUCTOR

David Peter Davies, Columbus, Ohio, assignor to McGraw-Edison Company, Elgin, Ill.

Filed Jan. 21, 1977, Ser. No. 761,446
Int. Cl.[2] B23K *31/02*
U.S. Cl. 228—180 R **8 Claims**



1. A method of forming an electrical and hydraulic connection for a conductor bar having a plurality of hollow water-cooled conductors comprising the steps:

producing mating connector clip members that form a conductor bar receiving chamber and a larger water cavity therebetween when placed together;

inserting strips of brazing material between adjacent hollow conductors in the conductor bar;

adjusting the cross-sectional length of the conductor bar to fit snuggly in conductor bar receiving chamber portions of said clip members;

placing a band of brazing material in said conductor bar receiving chamber portions of each of said clip members, said bands of brazing material being sufficiently thick to insure that the cross-sectional width of the conductor bar added to the thickness of said bands is greater than the width of said conductor bar receiving chamber;

locating the conductor bar between said clip members in said conductor bar receiving chamber portions thereof;

heating said clip members and the conductor bar to the melting temperature of said strips and bands of brazing material;

forcing said clip members together with the conductor bar therebetween until said clip members are brought into contact with one another; and

preventing brazing material from building up in the open ends of the hollow conductors of the conductor bar.

4,066,204

PROCESS AND DEVICE FOR UNSOLDERING SEMICONDUCTOR MODULES IN THE FLIP-CHIP TECHNIQUE

Oskar Wirbser, Unterpfaffenhofen, and Nikolaus Ernst, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

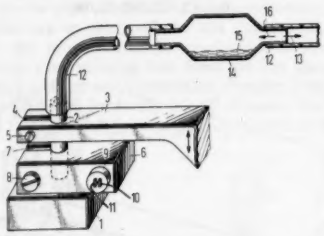
Filed June 14, 1976, Ser. No. 695,821
Claims priority, application Germany, July 2, 1975, 2529554
Int. Cl.[2] H05L *21/70*; B23K *3/00*
U.S. Cl. 228—264 **4 Claims**

1. A method in the flip-chip technique for unsoldering semiconductor modules which are soldered onto terminal surfaces of a carrier by terminal pads composed of soft solder, comprising the steps of:

a. placing a suction cup with a base forming a filter onto the semiconductor module to be unsoldered such that the module is drawn against the filter when suction is applied;

b. melting the terminal pads with heat supplied through the suction cup and the semiconductor module;

c. raising the suction cup together with the semiconductor module;
d. removing the semiconductor module;

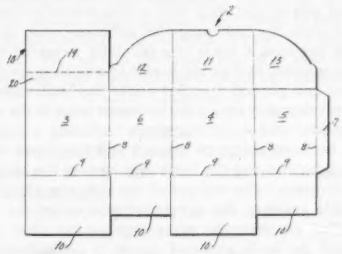


e. placing the suction cup onto the terminal surfaces; and
f. melting and sucking away remaining soft solder residues through the filter.

4,066,205
BIN BOX

Harold J. Griffith, Galesburg, Ill., assignor to Alton Box Board Company, Alton, Ill.

Filed Nov. 22, 1976, Ser. No. 743,683
Int. Cl.[2] B65D *5/72*
U.S. Cl. 229—17 B **4 Claims**

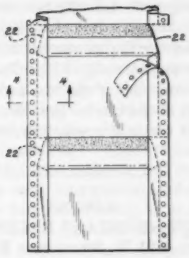


1. A bin box for supporting bulk material and formed having an upper, bottom, and a pair of side walls connected together and folded to create a tubular form, a series of flaps connecting to one end of the tubular form and folded to provide closure at said end of the box, a pivotal panel foldably connected to the bottom wall at the opposite end of the box, a pair of lateral flaps, one of each lateral flap foldably connected to a side of said pivotal panel, said lateral flaps normally arranged within the tubular form of the box and adjacent to the said side walls, said pivotal panel completely covering the opposite end of the box when said panel is pivoted into closure, at least one portion being provided upon the upper end of each lateral flap and provided for wedging against the interior of the upper wall as the pivotal flap is pulled to limit the extent of its opening, said pivotal panel completely covering the opposite end of the box when said panel is pivoted into closure, and another flap foldably connecting to the upper wall at the opposite end of said box, said flap providing coverage over the pivotal panel when the box is maintained in closure.

4,066,206
CONTINUOUS ENVELOPE ASSEMBLY

Charles L. Peterson, Crystal Lake, Ill., assignor to Uarco Incorporated, Barrington, Ill.

Filed Mar. 22, 1977, Ser. No. 780,005
Int. Cl.[2] B65D *27/10*
U.S. Cl. 229—69 **5 Claims**

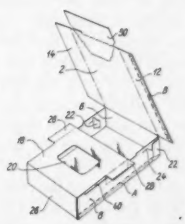


1. A continuous envelope assembly comprising:
an elongated ply of paper having control punch margins along longitudinal edges thereof;
individual envelopes in said assembly being delimited by transverse lines of weakening extending across said assembly;
die cuts in said ply adjacent both longitudinal edges thereof and adjoining said lines of weakening at one side thereof to define the corners of the envelope flap;
first glue lines on said ply adjacent said lines of weakening and on the sides thereof opposite said die cuts;
individual sheets having widths less than said ply and lengths less than the distance between lines of weakening secured to said ply by said first glue lines;
said ply longitudinal edges being folded over the longitudinal edges of said individual sheets;
second glue lines securing said ply longitudinal edges to said sheet longitudinal edges;
said control punch margins being reverse folded away from said sheets to extend to the sides of the respective sheet longitudinal edges.

4,066,207
DISPENSER CARTON BOXES

Frode Jorgensen-Beck, and Heinrich Wilhelm Lambach, both of Horsens, Denmark, assignors to Brdr. Schur International A/S, J. W. Schursevej, Denmark

Filed July 20, 1976, Ser. No. 707,082
Int. Cl.[2] B65D *5/72*
U.S. Cl. 229—17 SC **57 Claims**



1. A sales and dispenser carton box having a top panel with a dispenser opening normally closed by a closing plate portion arranged generally inside the box and being displaceable to open and close the dispenser opening, said closing plate portion having an outer edge located outside the box and connected with one edge of a box front end panel, the opposite

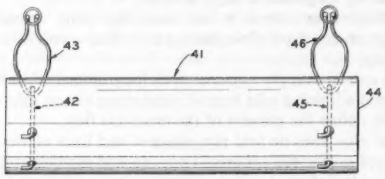
edge of which is hinged to a box bottom panel whereby the front end panel may be pivoted so as to displace the closing plate for opening and closing the dispenser opening, characterized in that at least one side edge portion of the closing plate is located near the adjacent side panel of the box and provided with a side flap which is folded down along said side panel and slidingly supported by an elongated carton portion so as to support the closing plate slidingly against or near to the inner or lower side of the top panel provided with said dispenser opening, while said side flap or another corresponding side flap located e.g. at the opposite edge of the closing plate has a front edge facing the front end of the box and cooperating with a rigid stop portion of the box so as to form a stop edge effectively limiting the forward opening movement of the closing plate.

4,066,208

THEFT RESISTANT RECEPTACLE

Norman A. Jones, 4591 W. Streetsboro Road, Richfield, Ohio 44286

Filed Feb. 24, 1977, Ser. No. 771,768
Int. Cl.[2] A47G *29/12*
U.S. Cl. 232—1 C **4 Claims**



1. A detachable holder for a newspaper, comprising:

an elongated newspaper holding receptacle having a peripheral wall, the interior of the receptacle being inaccessible through its peripheral wall, and said receptacle having at an end a restricted entry passage through which a rolled newspaper can be inserted readily and removed only with difficulty, said receptacle being and adapted to be disposed horizontally, on a floor, at or near the outer face of the lower margin of a door and to extend, endwise of the receptacle, alongside said face;

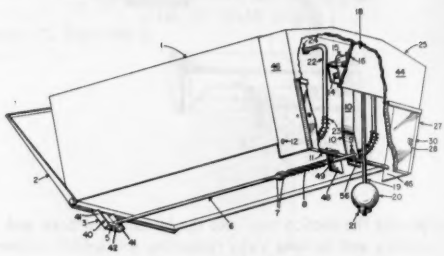
bracket means carried by the receptacle near the ends of the receptacle, and having a first portion swingably connected to the receptacle for swinging upwardly and downwardly about a horizontal axis, to and past a horizontal plane through said axis, when the receptacle is so disposed horizontally, and positioned to extend generally horizontally laterally of the peripheral wall of the receptacle from the outside of the door, beneath the lower edge of the door, with an inner end disposed at the inside of the door, and having at said inner end a retaining portion disposed at an angle to said first portion, and said portions being positioned so that, while said first portion is beneath the lower edge of the door and said receptacle is disposed with said side wall closely alongside said outer face of the door, said second portion can engage the inner face of the door with slight clearance for constraining the bracket from removal outwardly of the door from beneath said lower edge of the door and the receptacle from movement outwardly from the door, while the door is closed, said bracket means comprising two separate brackets, one near each end of the receptacle, and each bracket including an eyelet secured to the receptacle and exposed externally of the peripheral wall thereof; and said first portion of each bracket having a portion spaced from its said retaining portion and loosely swivelly engaged in said eyelet for swinging upwardly and downwardly relative to the eyelet and receptacle.

4,066,209

MAILBOX SIGNAL KIT

Robert D. Brake, 4051 S. Fairway, Springfield, Mo. 65804

Filed Jan. 15, 1976, Ser. No. 649,537
Int. Cl.[2] B65D *91/00*
U.S. Cl. 232—35 **1 Claim**



1. A mailbox comprising a receptacle provided with an open end, a vertically swinging hinge door to close said open end, said door having attached to the outer face thereof a bracket extending below the bottom of said receptacle, a signal indicator housing attached to the end of the receptacle opposite to the door, indicator means mounted for vertical movement within said indicator housing and movable from a non-viewable position to a viewable position, actuating means connecting the door-mounted bracket with the indicator means structure, said indicator means including an indicator plate movable vertically for viewing and non-viewing, said plate being mounted on two parallel support rods aligned in a vertical position, a buffer spring mounted on at least one support rod below the indicator plate for absorbing the shock of the indicator plate dropping by means of gravity force from the non-viewable position to the viewable position, a reset rod extending below the indicator housing and connected with the indicator plate for moving the indicator plate from the viewable position to the non-viewable position, a signal ball mounted on the lower end of said reset rod, a latch roller mounted on the indicator plate for retaining the indicator plate in the non-viewable position, a latch arm pivotally mounted within the indicator housing and spring-biased to a latching position with the upper end portion engaged under the latch roller to positively yet releasably retain the indicator plate in the non-viewable position, said actuating means including a push rod extending between the door bracket and the lower end of the latch arm for moving the latch arm against the spring bias to release the latch roller and permit the indicator plate to drop to a viewable position, the upper end portion of the latch arm being offset whereby the roller engages the offset upper end portion of the latch arm and moves it pivotally against the spring bias when the indicator plate is lifted to enable the latch roller to roll past the upper end of the latch arm so that the spring bias will move the upper end of the latch arm into latching position under the roller, said indicator plate being distinguishably colored for easy observation, said housing including an opaque wall portion overlying and concealing the indicator plate when in its lifted non-viewable position, said housing including a lower transparent wall portion overlying and revealing said indicator plate when in its lowered viewable position.

4,066,210

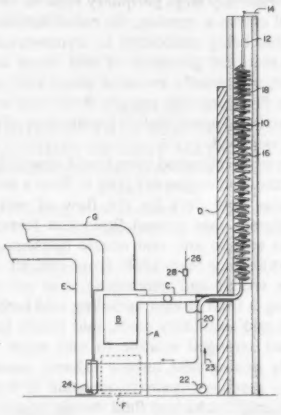
CHIMNEY HEAT RECLAIMER

Alonza R. Pemberton, R.R. 1, Box 17, and Daniel R. Pemberton, R.R. 1, Box 78, both of Fredericksburg, Va. 22401

Filed May 20, 1975, Ser. No. 579,201
Int. Cl.[2] F24D *5/04*
U.S. Cl. 237—53 **7 Claims**

1. In combination with a heating system which includes an enclosed air space, a fuel combustion chamber within said air

space and cold and hot air ducts leading to and from said air space for cold return air and heated air, respectively, means for circulating air from said cold air duct through said air space and past said combustion chamber to said hot air duct, a chimney, and a smoke pipe connected to said combustion chamber and said chimney to carry off the hot gaseous products of combustion and provide draft for combustion of fuel in said chamber, means for utilizing heat from the flue gases in said chimney emitted from said combustion chamber comprising a tubular coil extending upwardly in said chimney, for liquid to absorb heat from the flue gases, a pipe connected to the top of



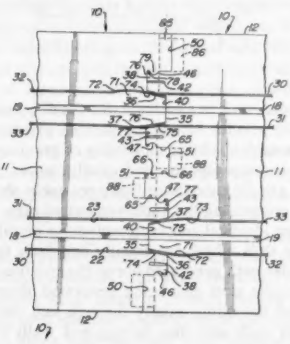
said coil to form an expansion chamber and a support connected to the upper end of said pipe and supported on the top of said chimney, a radiating unit having passages for circulation of liquid and constructed for passing air through said unit to be heated by liquid in said passages, said unit being positioned so that said means for circulating air passes air from said cold duct through said unit, connecting lines from said coil to said passages in said radiating unit, and a pump in said lines to circulate liquid through said coil and through the passages in said radiating unit, so that the liquid heated in said coil heats the air from said cold duct passing through said radiating unit.

4,066,211

MODEL TRACK SECTION

Sze Hong Mak, 57 Ma Tau Wai Road "H" Ground Floor, Kowloon, Hong Kong

Filed Feb. 24, 1976, Ser. No. 660,994
Int. Cl.[2] A63H *19/30*
U.S. Cl. 238—10 F **10 Claims**



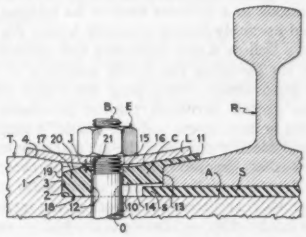
9. A track section comprising a generally flat bed having one end region and an other end region, a pair of conductive rails on said bed longitudinally coextensive therewith and having a pair of adjacent facing sides and a pair of nonfacing sides, said one end region of said bed having a longitudinally inwardly extending opening between the adjacent facing sides of said rails, the other end region of said bed having a pair of longitudinally inwardly extending cutouts along the nonfacing sides of said rails, the rail ends at said one bed end region being spaced apart a greater distance and the rail ends at the other bed end region being spaced apart a lesser distance for longitudinal insertion of the lesser spaced rail ends between a pair of greater spaced rail ends of a like track section when said track sections are moved in longitudinal end-to-end assembled relation, resilient means associated with at least one of said greater and lesser spaced rail ends for deflection thereof upon said insertion, and snap formations on opposite bed end regions for interfitting engagement with opposite bed end regions of like track sections upon said longitudinal end-to-end assembly, certain of said snap formations being in at least one of said cutouts spaced from said at least one of said greater and lesser spaced rail ends, said resilient means comprising a slit extending longitudinally inwardly from said one end region of said bed and spaced outwardly from each of said rails, the region of said bed between each of said slits and the rail adjacent to a respective slit defining a resilient backing portion.

4,066,212

SPRING RAIL CLIP WITH TIGHTENING LIMITING FEATURE

Roger Paul Sonneville, 5, rue Maurice Ravel, 92210 Saint-Cloud, France

Filed June 8, 1976, Ser. No. 694,036
Claims priority, application France, June 26, 1975, 75.20068
Int. Cl.[2] E01B *9/30*
U.S. Cl. 238—349 **12 Claims**



1. In a device for fixing and supporting a rail of a railway track which rail has a flange, comprising a support having a first portion defining a support table for the rail and second portions each having an upper surface higher than said table and defining a shoulder which extends upwardly from said support table at opposite ends of the support table, a pad interposed between the rail and the support table, an insulating clip having a body which is interposed between the shoulder and the flange and defines an aperture and a nose portion bearing against the flange of the rail, at least one elastically yieldable strip defining an aperture and placed on top of the clip to extend over the clip, the nose portion being interposed between the strip and the flange and the strip being located to be supported by said upper surface of one of said second portions, and fixing means extending through the apertures in the body of the clip and the strip for fixing the strip and clip to the support, the body of the clip comprising, on a side thereof opposed to the nose portion, a heel portion defining a first surface which faces toward said table and a second surface which is supported laterally against the shoulder, the body of the clip defining substantially in a center part thereof and upper face which is substantially parallel to the strip; the improvement wherein at least a part of said first surface is located so that it at least partly surrounds said aperture of the clip and

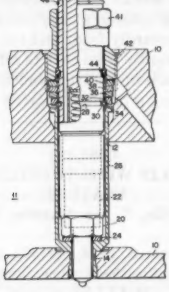
is in abutting relation to said table, the arrangement being such that, beyond a predetermined tightening force exerted by said fixing means on the strip, the additional force is transmitted to the support through the body and the heel portion of the clip and said first surface of the clip and said table of the support.

4,066,213

FUEL INJECTION NOZZLE ASSEMBLY

Richard Herbert Stampe, Dike, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Apr. 16, 1976, Ser. No. 677,779
Int. Cl.[2] B05B *1/30*
U.S. Cl. 239—533.3 **4 Claims**



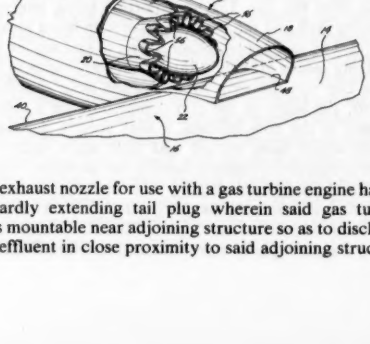
1. In a fuel injection nozzle assembly for fastening a fuel injection nozzle to a cylinder head of an internal combustion engine, said assembly having a nozzle holder for holding the nozzle and a hollow screw encircling and slidable on the nozzle holder for fastening the nozzle assembly to the cylinder head, the improvement comprising: the nozzle holder having an annular groove provided therein proximate the nozzle between the hollow screw and the nozzle; a snap ring device partially and radially engaging the annular groove; an annular retaining washer disposed between the hollow screw and the snap ring device partially abutting and radially encircling the snap ring device; and annular conical spring means encircling the nozzle holder disposed between the hollow screw and the retaining washer.

4,066,214

GAS TURBINE EXHAUST NOZZLE FOR CONTROLLED TEMPERATURE FLOW ACROSS ADJOINING AIRFOILS

Joseph M. Johnson, Bothell, Wash., assignor to The Boeing Company, Seattle, Wash. and Aeritalia S.p.A., Napoli, Italy

Filed Oct. 14, 1976, Ser. No. 732,520
Int. Cl.[2] B64C *15/00*
U.S. Cl. 239—265.19 **11 Claims**



1. An exhaust nozzle for use with a gas turbine engine having a rearwardly extending tail plug wherein said gas turbine engine is mountable near adjoining structure so as to discharge exhaust effluent in close proximity to said adjoining structure, said exhaust nozzle for selectively mixing the relatively high temperature, high velocity exhaust gases supplied by said gas turbine engine with a lower temperature secondary gaseous stream to prevent overheating of said adjoining structure, said exhaust nozzle comprising:

a generally tubular mixer section having an entrance opening at one end thereof for receiving said exhaust gases and a plurality of axially extending lobes spaced about the periphery of said tubular mixer section, each of said lobes of increasing radial dimension relative to the length of said mixer section to form an aft terminus of said mixer section having a relatively large periphery relative to the periphery of said entrance opening, the radial dimension of each of said lobes being established to asymmetrically pattern the cross-sectional geometry of said mixer section, said mixer section coaxially mounted about said tail plug for forming a first generally annular flow duct between said tail plug and said mixer section for the flow of said turbine exhaust gases; and

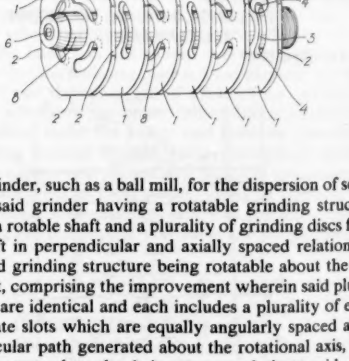
a nozzle housing mounted about said coaxially mounted mixer section and engine tail plug to form a second generally annular flow duct for the flow of said secondary gaseous stream, said second flow duct formed between said mixer section and said nozzle housing, said nozzle housing extending rearwardly from said aft terminus of said mixer section and terminating in an exit opening for discharging a fluid stream including said turbine exhaust gases and said secondary gases, said nozzle housing contoured and arranged relative to said mixer section for selectively mixing said turbine exhaust gases with said secondary gaseous stream to maintain at least selected regions of said discharged fluid stream adjacent said nozzle housing at a lower temperature than the temperature of the central region of said discharged fluid stream.

4,066,215

DISC FOR GRINDER

Carlos Oliver Pujol, Marina St. No. 51, Badalona (Barcelona), Spain

Filed Oct. 18, 1976, Ser. No. 733,359
Claims priority, application Spain, July 13, 1976, 222298
Int. Cl.[2] B02C *23/36*
U.S. Cl. 241—46.11 **2 Claims**



1. In a grinder, such as a ball mill, for the dispersion of solids in liquids, said grinder having a rotatable grinding structure formed by a rotable shaft and a plurality of grinding discs fixed to said shaft in perpendicular and axially spaced relationship thereto, said grinding structure being rotatable about the axis of said shaft, comprising the improvement wherein said plurality of discs are identical and each includes a plurality of elongated arcuate slots which are equally angularly spaced apart along a circular path generated about the rotational axis, said elongated arcuate slots also being generated about said rotational axis and extending axially through said disc, the elongated slots of each said disc having end walls defining the opposite ends of the slot, said end walls defining the leading and trailing edges of each slot when the disc is rotated, the pair of end walls as defining the opposite ends of each said slot

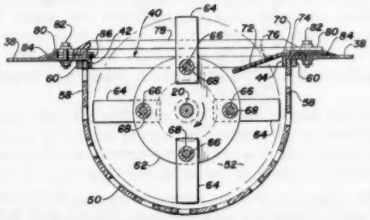
being sloped in opposite directions relative to the rotational axis so that the slot terminates in an elongated opening formed in one face of the disc which is larger than the elongated opening formed by the slot in the other face of the disc, and said discs being mounted on said shaft in opposed axially spaced pairs with the discs of each said pair themselves being axially spaced apart, the discs of each said pair being disposed with said one faces thereof directed toward one another, and said plurality of axially spaced discs being positioned so that the slots in the axially adjacent discs are alternately angularly offset so that the slots as formed in any two adjacent discs are not axially aligned.

4,066,216

TOOTHED PLATE FOR FACILITATING DISINTEGRATION OF CROP MATERIAL CLUMPS BY THE HAMMERMILL MECHANISM OF A TUB GRINDER MACHINE

Thomas W. Waldrop, New Holland, Pa., and John R. Flanagan, Salt Lake City, Utah, assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Sept. 24, 1976, Ser. No. 726,711
Int. Cl.[2] B02C *13/04*
U.S. Cl. 241—190 **3 Claims**



1. In a tub grinder machine having a mobile frame, a crop material receiving tub mounted on said frame and a hammermill grinding mechanism mounted below said tub, said tub including a bottom wall stationarily mounted on said frame, with an opening formed therein, and a generally upright cylindrical side wall bounding the periphery of said bottom wall and being mounted for rotation about a generally vertical axis relative to said bottom wall, said hammermill mechanism being mounted below said bottom wall opening and including a rotatable shaft and a plurality of radially extending, axially spaced hammer elements operatively mounted thereon which move in generally circular paths projecting upwardly through said opening upon rotation of said shaft so as to engage and grind crop material being moved about said bottom wall and delivered to said opening therein as said side wall of said tub is rotated, said machine also having drive means operable to effect rotation of said side wall and of said hammermill shaft, the improvement which comprises:

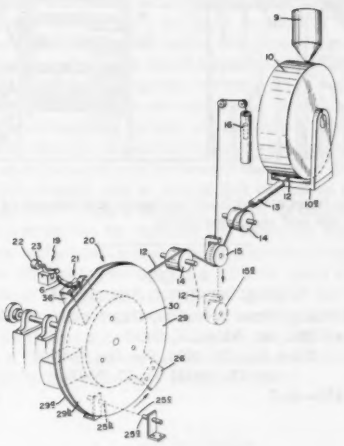
an elongated plate mounted to said bottom wall along a crop material receiving edge of said opening therein, a longitudinal marginal edge portion of said plate extending into said opening and having a series of spaced apart notches formed therealong so as to define a series of spaced apart and generally co-planar teeth which coact with said moving hammer elements to facilitate the ability of the latter to disintegrate crop material clumps passing through said opening over said teeth, said series of spaced apart notches formed along said marginal edge portion of said plate gradually widen toward the edge of said plate so as to define said teeth with configurations convergently tapering toward the outer ends thereof.

4,066,217

TAIL END GRIP MECHANISM

Robert E. Smith, Monte Sereno; Frank S. Chytil, Escondido, both of Calif.; George Feldstein, and Dorman J. Swartz, both of Madison, N.J., assignors to Allied Chemical Corporation, Morristown, N.J.

Filed July 9, 1976, Ser. No. 704,009
Int. Cl.[2] B65H *75/28*
U.S. Cl. 242—25 R **5 Claims**



1. An apparatus for gripping and retaining the tail end of a moving filament contiguous to a rotating storage reel comprising in combination:

a. a rotable reel mounting assembly for receiving said reel;

b. a pivotal gripping means mounted on said reel mounting assembly adapted to be remotely actuated to grip the tail end of the filament which is stored on a reel carried on said reel mounting assembly;

c. sensing means adapted to detect passage of the tail end of the filament and to generate a signal responsive to such passage;

d. triggering means in circuit with said sensing means adapted to actuate said pivotal gripping means to grip the tail end of the filament responsive to the signal generated by said sensing means.

4,066,218

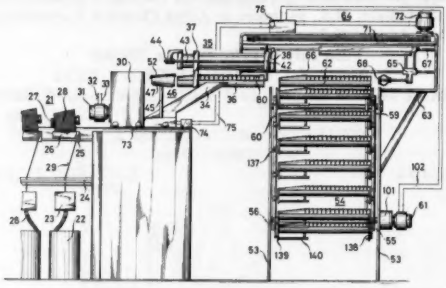
METHOD AND DEVICE FOR SUPPLYING EMPTY CONICAL COIL CORES TO THE INDIVIDUAL WINDING STATIONS OF A TEXTILE MACHINE

Heinz Kamp, Rickelrath, Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Germany

Filed Sept. 29, 1975, Ser. No. 617,436
Claims priority, application Germany, Sept. 27, 1974, 2446162
Int. Cl.[2] B65H *54/02*
U.S. Cl. 242—35.5 A **9 Claims**

5. Apparatus for carrying out a method of feeding unwound conical coil cores to individual winding stations of a textile machine comprising coil-exchanging means for replacing fully wound coils at a plurality of winding stations with unwound coinical coil cores, a core magazine at the textile machine having means for receiving therein sticks of telescoped coil cores, transfer means for transferring at least part of individual sticks of cores to the coil exchanging device from said core magazine, a take-up and storage device for sticks of cores and a delivery device for delivering individual coil cores, both located, at least in part, on the coil exchanging means, and means for maintaining relative movement between the winding

stations and the core magazine, on the one hand, and the coil exchanging means, on the other hand, at all times other than



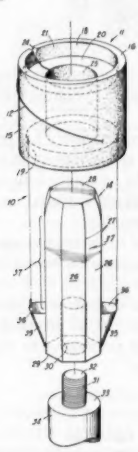
respective times at which coil exchange and take-up of sticks of cores by the coil magazine occur.

4,066,219

TWINE WINDING ASSEMBLY

Austin S. Sharp, Stone Mountain, Ga., assignor to Wellington Puritan Mills, Inc., Madison, Ga.

Filed Aug. 30, 1976, Ser. No. 718,409
Int. Cl.[2] B65H *75/30, 79/00*
U.S. Cl. 242—46.2 **2 Claims**



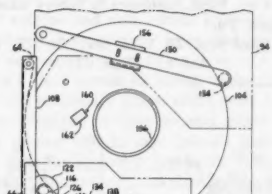
1. In a textile winding assembly, a cylindrical spool adapted to have a textile strand wound on its periphery, said spool being unitary and formed entirely of structural foam, said spool having a central axial through bore of predetermined constant diameter, and said spool provided in its opposite end faces with recesses of equal depths below the end faces and substantially equal diameters and forming on said spool a pair of opposite end flat spool locator faces below the spool end faces and annular flange portions surrounding the locator faces, and a spindle for supporting and driving the spool rotationally on the axis of said bore and adapted to be coupled to a rotational element of a winding machine, said spindle having an elongated shank portion insertable entirely through said bore and having bore-engaging projections which extend radially beyond the diameter of the bore, whereby entry of the shank portion through said bore will deform said bore permanently by crushing said structural foam adjacent to said projections and thereby allowing said spindle to create a positive interlocking driving engagement with said spool, and a pair of radiating lugs on said spindle projecting beyond opposite sides of said shank and having a pair of flat end faces in lateral alignment across the shank, said end faces adapted to abut one of said flat spool locator faces when said spool is assembled on the spindle.

4,066,220

COPY PAPER STORING AND FEEDING APPARATUS

Christian A. Beck, Ridgefield; William A. Ross, Darien, and James E. Burke, Norwalk, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Nov. 2, 1976, Ser. No. 738,043
Int. Cl.[2] B65H *17/20, 19/10*
U.S. Cl. 242—55 **5 Claims**



1. In a copying machine wherein copy paper is stored in roll form and utilized for making copies of original documents, apparatus for storing and feeding the copy paper, said apparatus comprising:

A. a frame,

B. means mounting said frame in the copying machine adjacent one end thereof for relative movement with respect to the copying machine between an operative copy paper feeding position wherein said frame is disposed within the copying machine and an inoperative copy paper loading position wherein said frame is disposed exteriorily of the copying machine,

C. support means carried by said frame for rotatably supporting a roll of copy paper on the peripheral surface of said roll of copy paper with said roll of copy paper being free to rotate on said support means when said frame is in said operative copy paper feeding position,

D. copy paper feeding means mounted within the copying machine for intermittently withdrawing a predetermined length of copy paper from said roll, said copy paper feeding means being disposed adjacent the end of the copying machine through which said frame is moved between said operative and inoperative positions, and,

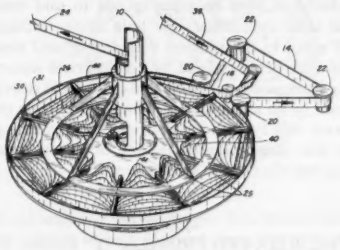
E. guide means carried by said frame and defining a copy paper path from said copy paper roll support means to said feeding means, said path extending generally upwardly from said roll support means and thence generally downwardly to said feeding means, said guide means comprising a subframe pivotally mounted on said frame adjacent the outer end thereof and movable therewith, said subframe being normally disposed in a vertically upright position and carrying guide rollers at the upper and lower ends thereof to define said copy paper path when said subframe is in said upright position.

4,066,221

METHOD OF AND APPARATUS FOR THE TAPE LOADING AND USE OF A SINGLE TURNTABLE IN THE RENDITION OF A TAPED PROGRAM

J. Ralph Johnson, 573 Wellham Loop, La Place, La. 70068

Filed Oct. 27, 1976, Ser. No. 736,277
Int. Cl.[2] B65H 17/48
U.S. Cl. 242—55.19 A 10 Claims



1. Method of tape loading and using a turntable in the rendition of a taped program comprising the steps of:

a. defining a peripheral flange and tape entrance therethrough around a rotating turntable:

b. winding tape on said rotating turntable through said tape entrance and against said peripheral flange, the winding being of equal length per revolution of said turntable, each said winding being displaced radially inwardly by each successive winding and following inwardly curving paths of progressively greater curvature as the number of said windings increase;

c. biasing radially said windings adjacent said flange at a plurality of spaced points therearound for inhibiting said windings from curving inwardly at said bias points and to maximize curving therebetween and equal distribution therearound;

d. connecting the inboard and outboard tape ends of the loaded tape to form a closed loop with an off-turntable bight adapted to engage in and with cooperating apparatus for rendition of taped program;

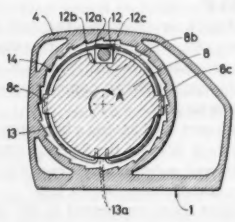
e. continuously rotating the loaded turntable and simutaneously energizing said cooperating apparatus to draw tape from the inner winding and load tape at the outer winding in equal amounts per revolution of said turntable in continuous renditions of the taped program and the elimination of friction and slippage between windings.

4,066,222

DEVICE IN CONNECTION WITH LOCKING REELING MEANS FOR SAFETY BELTS FOR VEHICLES

Sven Roland Hjelte, Vimmerby, Sweden, and Lennart Eksell, Valldoreix, Spain, assignors to Svensk Tryckgjuntning SH AB, Vimmerby, Sweden

Filed June 16, 1976, Ser. No. 696,625
Int. Cl.[2] A62B 35/02; B65H 75/48
U.S. Cl. 242—107.4 B 4 Claims



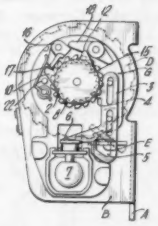
1. Device for locking reeling means of safety belts for vehicles including a frame adapted to be fixed to a vehicle, a stationary track on said frame, a rotatable core element for a safety belt which element is spring biased in the wind-up direction and at one of its ends supports at least one locking body rotatable with the core element, said locking body assuming a locked position upon sudden rapid unwinding of the safety belt by engaging said stationary track, the improvement comprising a longitudinal groove of trapezoidal cross-sectional area tapering radially and inwardly to form a bottom portion, said groove being axially disposed at one end of said rotatable core element, said locking body being of rectangular or square cross-sectional area disposed within said groove and having a bottom portion of a width which substantially corresponds to the width of the bottom portion of said groove, a circumferental groove in the outer portion of said locking body and spring means received by said circumferential groove and retained by said core element for resiliently urging said locking body in an inoperative position toward the base of the groove in said core element, and an inertial disk carried on the outer end of said core element adjacent to said locking body and carrying a projection for engaging and displacing said locking body from said groove, said disk being normally rotatable with said core element but rotating at a different speed therefrom upon sudden changes in the rotational speed of the core element, thereby permitting the projection on the inertial disk to engage the locking member and displace the same so that said member in turn engages the stationary track and acts as a brake to prevent further rotation of the core element.

4,066,223

AUTOMATIC LOCKING SAFETY BELT RETRACTOR DEVICE

Juichiro Takada, Tokyo, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1976, Ser. No. 710,988
Claims priority, application Japan, Sept. 29, 1975, 50-116433
Int. Cl.[2] A62B 35/02; B65H 75/48
U.S. Cl. 242—107.4 A 9 Claims



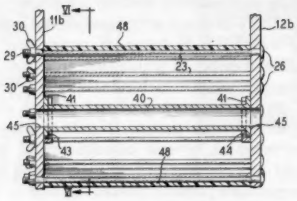
1. A safety belt retractor device comprising a reel rotatable in opposite belt retraction and extraction directions, spring means biasing said reel in a belt retraction rotation direction, a first braking means for braking said reel against rotation in a belt extraction direction and movable between a retracted release position and an advanced braking position, a second braking means for braking said reel against rotation in a belt retraction direction and movable between a retracted release position and an advanced braking position, and transfer means responsive to the actuation of said first braking means toward its advanced position for moving said second braking means toward its retracted position.

4,066,224

KNOCK-DOWN SHIPPING REEL FOR FLEXIBLE CABLE

William Hargreaves, and Olivia Nancy Hargreaves, both of 224 Old Short Hills Road, Short Hills, N.J. 07078

Filed Oct. 28, 1975, Ser. No. 626,132
Int. Cl.[2] B65H *75/22, 75/14*
U.S. Cl. 242—115 **10 Claims**



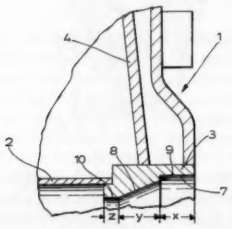
1. A knock-down reel for flexible cable and the like, comprising:
   - a pair of spaced flanges forming reel heads,
   - each of said reel heads having an opening concentric with the center thereof,
   - a spacer tube concentric with said openings and connected between said flanges to space said flanges apart and form a bearing for the reel,
   - spaced flexible members maintained under tension, and equally spaced radially outwardly of the center of said tube,
   - individual means for each flexible member and accessible from the outside of at least one of said reel heads for maintaining said flexible members under tension and said flanges in parallel spaced relation with respect to each other, and
   - segmental inserts mounted on said flexible members between said reel heads and carried by said flexible members and maintained to said flexible members by the compressive force of said flanges as tension is taken up on said flexible members.

4,066,225

REEL FOR CABLES, WIRES, AND THE LIKE

Ernst Bauer, Neustadt, Coburg, Germany, assignor to Industriewerk Nachf. Seifert & Co. KG, Neustadt near Coburg, Germany

Filed July 19, 1976, Ser. No. 706,416
Claims priority, application Germany, July 18, 1975, 2532156
Int. Cl.[2] B65H *75/14*
U.S. Cl. 242—118.8 **1 Claim**



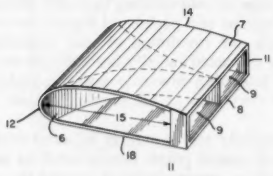
1. A reel for cables, wires or the like having a core and a central bore hole in the core for the mounting of both cylindrical and conical spindles of a processing machine, comprising hub means on the longitudinal ends of said central bore hole, means on said hub means defining an outer cylindrical bore hole axially juxtaposed to an inner conical bore hole, said outer cylindrical bore hole being of a larger diameter than the largest diameter of said conical bore hole, said outer cylindrical bore hole extending to the longitudinal end of said core, said conical bore hole having its large diameter disposed axially outwardly and terminating by a radial flange portion which also terminates the axially inner end of said outer cylindrical bore hole to thereby define a step between said outer cylindrical bore hole and said conical bore hole, said outer cylindrical bore hole having an axial length operable to receive and be supported by said cylindrical spindle, said conical bore hole being operable to receive and be supported by said conical spindle, an axially inner cylindrical bore hole juxtaposed to said conical bore hole, said inner cylindrical bore hole having a diameter substantially equal to the smallest diameter of said conical bore hole, said core being defined by a cylindrical sleeve member extending from said hub means, said cylindrical sleeve member being fitted on an axially inner cylindrical portion of said hub means, said axially inner cylindrical portion being radially opposite said inner cylindrical bore hole, and head flanges extending radially from said hub means.

4,066,226

AIRFOIL, REDUCED PROFILE, "Y" FLOW, HYBRID

Kenneth Edmund Fischer, 716 E. Main St., Berlin, Pa. 15530

Filed Apr. 9, 1976, Ser. No. 675,602
Int. Cl.[2] B64C *3/02*
U.S. Cl. 244—36 **1 Claim**



1. An airfoil having a conventional airfoil shape in longitudinal cross-section with a truncated trailing edge; upper and lower surfaces which provide the airfoil with a substantially rectangular planform and a closed continuous leading edge; each side of said arifoil has a side wall which extends from the leading edge adjacent the respective side of said airfoil to substantially the center of the trailing edge forming a substantially triangular shaped compartment in the center of the airfoil; the side and trailing edges of said airfoil are substantially completely open and form channels with said side walls which permit the air to flow from the sides of said airfoil between said upper and lower surfaces and exit through said open truncated trailing edge.

4,066,227

MEZZANINE STRUCTURE FOR WIDE-BODIED PASSENGER AIRCRAFT

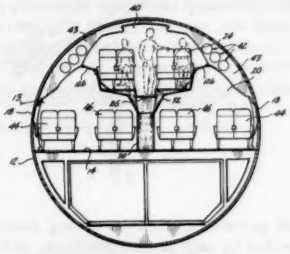
Christian K. E. Buchsel, 5900 119th Ave. SE., Bellevue, Wash. 98006

Filed July 16, 1976, Ser. No. 705,790
Int. Cl.[2] B64D *11/06*
U.S. Cl. 244—118 P **18 Claims**

1. An elevated deck structure movable into a fuselage compartment of an aircraft, said fuselage compartment including a main deck floor and sidewalls with windows, for providing a mezzanine within such fuselage compartment, said elevated deck structure comprising:
   - an elongated support wall having a bottom portion securable to the main deck floor of the fuselage compartment with said support wall substantially centered laterally within the fuselage compartment, and a top;
   - a mezzanine floor frame connected to the upper portion of said support wall and projecting laterally outwardly from said support wall in a centilevered fashion, on both sides

thereof, for providing a longitudinally extending mezzanine floor area; and

said mezzanine floor frame being narrower than the inner dimension of the fuselage compartment at the level of said mezzanine floor area, so as to leave a spacing between



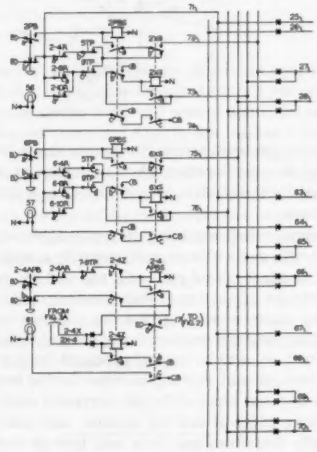
each sidewall and the mezzanine floor frame, said spacing being utilized to provide head room for main deck aisle space on each side of the mezzanine floor frame, said head room extending above the level of the mezzanine floor area.

4,066,228

ROUTE CONTROL SYSTEM FOR RAILROAD INTERLOCKINGS

J. Calvin Elder, Penn Hills, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Oct. 7, 1976, Ser. No. 730,342
Int. Cl.[2] B61L *27/00*
U.S. Cl. 246—5 **11 Claims**



1. Remote control apparatus for routing trains through a railroad interlocking which includes a plurality of locations marking the boundary limits of the interlocking track layout at which trains enter or exit the interlocking, track circuits for detecting train occupancy of predetermined track sections within the boundary limits, and control and indication means at the track wayside for track switches which establish individual routes, comprising in combination,

a. a selection means associated with each limit location and operable in pairs for sequentially selecting the entrance and exit locations of a desired track route,

b. a registry means coupled to each selection means and responsive to operation of that selection means for registering the selection of that location as an entrance or exit for a desired route,

c. primary means responsive to the selection of an exit location subsequent to an entrance location for locking out conflicting routes and all other possible exit locations and connected for holding a registered exit location stored,

d. an exit storage means for each location coupled for checking the non-occupancy of the track sections between the selected entrance location and the corresponding location when it is a possible exit and controlled by said primary means for retaining the exit storage only when that location is selected,

e. a separate selection means for each alternate route between any two locations in said interlocking layout,

f. a separate registry means controlled by each alternate route selection means for registering the selection of the corresponding alternate route in lieu of the basic route,

g. an auxiliary storage means associated with each alternate route selection means and controlled by said primary means and the registry means associated with each limit location of the corresponding basic route for storing the final establishment of any route, alternate or basic, between the associated limit locations,

1. each auxiliary storage means coupled for inhibiting the registration of the corresponding alternate route selection if the associated basic route is already established, and

h. secondary means for each location controlled by said primary means and by said track circuits in accordance with track occupancy conditions and coupled to the corresponding registry means for holding the entrance selection registered while the route is established,

1. each secondary means responsive to occupancy of the last track section in an established route for cancelling the entrance registry storage to release the established route,

i. each registry means further coupled for cascading the cancellation of a route entrance storage to release the associated exit selection registry and the corresponding exit storage,

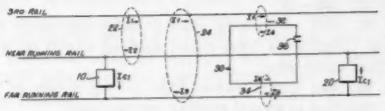
j. the pair of registry means for each limit location of each possible basic track route through said interlocking, any associated separate registry means for an alternate route, and the associated exit storage means coupled for jointly actuating said track switch control means to complete the corresponding track route when entrance and exit selections for that route or an associated alternate route are registered and stored.

4,066,229

DEVICE FOR PREVENTING TRACTION POWER HARMONIC INTERFERENCE ON HIGH FREQUENCY TRACK CIRCUITS

Garry E. Clark, Alberta, Canada, assignor to General Signal Corporation, Rochester, N.Y.

Filed Feb. 18, 1977, Ser. No. 770,174
Int. Cl.[2] B61L *21/00*
U.S. Cl. 246—34 CT **4 Claims**



1. In a system for use along a railroad trackway, involving an AC track circuit including a plurality of tuned circuits connected to near and far running rails for indicating the presence of a vehicle, the improvement which comprises:

an arrangement including a cancellation coil for canceling the circulating current which flows in the loop defined by

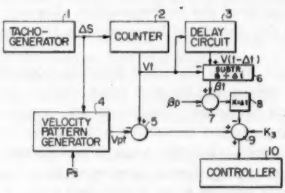
said near and far running rails and is normally accepted by said tuned circuits, said circulating current being due to the differential induction of noise currents from said third rail to said far running rail and to said near running rail, respectively, said cancellation coil including means for inducing corresponding noise current from said third rail into said cancellation coil and from said cancellation coil into said far running rail, and means for avoiding the inducing of the noise current from said coil into said near running rail, thereby to effectively cancel said circulating current.

4,066,230

AUTOMATIC BRAKING OR ACCELERATION CONTROL SYSTEM FOR A VEHICLE

Makoto Nohmi, Kokubunji; Nobuyuki Fujikura, Hamura; Chiaki Ueda, Mito, and Eiichi Toyota, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 31, 1976, Ser. No. 672,142
Claims priority, application Japan, Apr. 2, 1975, 50-39078
Int. Cl.[2] B01L *3/08*
U.S. Cl. 246—182 B **10 Claims**



1. An automatic braking and acceleration control system for a vehicle comprising

first means responsive to a first target velocity pattern and the measured vehicle velocity for generating a first vehicle control signal;

second means responsive to a second target velocity pattern and the measured vehicle velocity for generating a second vehicle control signal;

third means for controlling the velocity of said vehicle; and

fourth means responsive to the relative magnitudes of said first and second vehicle control signals for applying one of said first and second vehicle control signals to said third means in control thereof.

4,066,231

LOCKING STAND FOR SMALL, PORTABLE DEVICES

Randal E. Bahner, 220 "D". W. Carriage Drive, Santa Ana, Calif. 92707, and Jay B. Haws, 431 Madrona Ave., Brea, Calif. 92621

Continuation-in-part of Ser. No. 607,100, Aug. 25, 1975, Pat. No. 3,984,075. This application Aug. 16, 1976, Ser. No. 714,733
The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—13 **10 Claims**

1. A stand for locking small portable equipment requiring visual observation from plural viewing angles on a support surface, comprising:

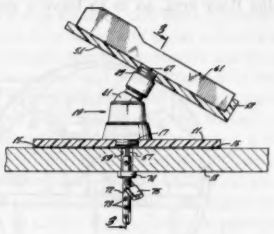
a ball and socket swivel joint having a pair of elements attached to swivel relative one another;

means for supporting one element of said swivel joint on said support surface;

means for supporting said small portable equipment on the other element of said swivel joint to permit said small portable equipment to swivel relative said support surface;

said swivel joint, said means for supporting one element of said swivel joint and said means for supporting said small portable equipment including apertures, said apertures aligned to provide a conduit through said stand; and

an elongate, flexible member attached at one end to said small, portable equipment, passing through said conduit provided by said aligned apertures, and attached at the other end to said support surface to prevent removal of said small, portable equipment from said support surface.

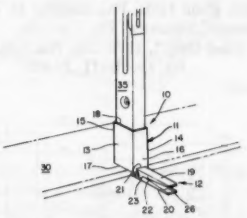


4,066,232

CLAMP-ON LEVEL HOLDER

Edward J. Hermeyer, P.O. Box 82, Gardnerville, Nev. 89410

Filed Sept. 23, 1976, Ser. No. 725,682
Int. Cl.[2] G01C *9/00*
U.S. Cl. 248—226.2 **4 Claims**



1. A clamp on level holder for maintaining a level in a safe and out of the way location when not in use or in a safe and convenient location when in use, the device comprising, in combination:

a rectangular shell consisting of opposed side walls, opposed end walls, and a bottom wall integrally conjoined with the bottom edges of said side walls and said end walls to form an interior compartment therebetween; and

a spring clamp consisting of a top member and a bottom member, said top member being securely affixed to a said end wall so as to be centrally located thereon adjacent to said bottom wall, said top member further being provided with opposed tapered flanges perpendicularly conjoining the long edges of said top member and extending downwardly therefrom and from said bottom wall, with said flanges having a semi-circular lip disposed a short distance from said end wall of said shell and provided with round through holes centrally located within said lips so as to be in axial alignment with each other, said bottom member being generally of the same configuration as said top member but longer in overall length with an extension being angularly disposed between said bottom wall of said shell, said bottom member having opposed tapered flanges perpendicularly conjoining the long edges of said bottom member so as to extend upwardly therefrom and toward said bottom wall of said shell and extending in length along said bottom member rearwardly of said end wall, said flanges being further provided with a semi-circular lip and with round through holes so as to axially line up

internally between said flanges and said lips on said top member; and

a coil spring affixed between said lips on said flanges and between said top member and said bottom member, with said spring affixed therein by means of a pin extending between said round holes in said lips, the ends of said spring being positioned against the inside surfaces of said top member and said bottom member and internally of said flanges so as to bias said top member upwardly from said bottom member wherein said bottom wall of said shell and said extension cooperate to form a clamp.

4,066,233

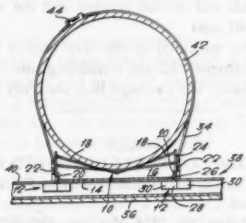
SECURING DEVICE

Robert Arthur Henderson Heard, Church Farm, 63 Church Lane, Backwell, Bristol, England

Filed June 14, 1976, Ser. No. 695,412

Int. Cl.[2] A47B *96/06*

U.S. Cl. 248—231 **4 Claims**



1. A device for use in securing an object to a post or the like body, said device comprising a saddle having a pair of opposite side members of similar form and spaced apart, the side members being shaped along one edge to seat against a post, and a pair of attachment members loosely carried at opposite ends of the saddle, each attachment member having a body portion located at the respective end of the saddle and a stem portion projecting beyond the saddle in the direction remote from said shaped edges of the side members thereof and provided with abutment means to engage an object to be secured, each body portion being constructed and arranged to receive at least one strap such that a strap may be passed around a post to secure the saddle to such a post and tightened to cause a gripping action on an object located between the abutment means of the attachment members and the saddle.

4,066,234

UNIVERSAL SHOCK AND VIBRATION MOUNTS

James M. Nycum, Holland, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 23, 1974, Ser. No. 435,786

Int. Cl.[2] F16F *15/04*

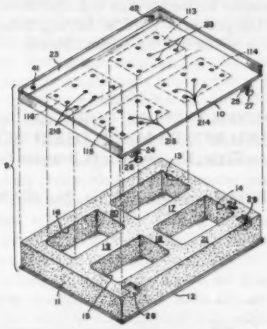
U.S. Cl. 248—358 R **9 Claims**

1. A universal shock and vibration mount comprising:

a lower plate;

an upper plate having a plurality of openings therethrough;

a resilient member disposed between the upper plate and the lower plate and having a cavity therein communicating with said plurality of openings; and



cover means superimposed upon a predetermined number of said plurality of openings for occluding the predetermined number of openings.

4,066,235

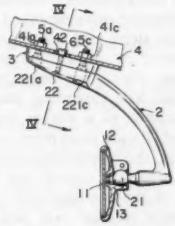
BREAKAWAY MIRROR MOUNTING

Setsuo Hashiguchi, Yamato, Japan, assignor to Ichikoh Industries Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 574,086, May 2, 1975, abandoned, which is a continuation of Ser. No. 407,489, Oct. 18, 1973, abandoned. This application Dec. 1, 1975, Ser. No. 636,744

Int. Cl.[2] B60R *1/02*

U.S. Cl. 248—482 **1 Claim**



1. A breakaway mounting for a mirror attached to one end of a supporting arm, said mounting comprising:

a base member;

continuous grooves formed in a matching relationship on opposite surfaces of said base member, said grooves defining a thinned region therebetween and having varying depths whereby the bottoms of the respective grooves lie in substantially parallel planes which are inclined with respect to the planes of said base member surfaces;

a plurality of spaced apertures in said thinned region extending between said grooves;

means for interconnecting a portion of the base member enclosed by said grooves to the end of said supporting arm opposite that to which the mirror is attached, said opposite end comprising an enlarged arm portion having a contour substantially corresponding to that of the base member; and

means for joining the remaining portion of the base member to an external support whereby when said mounting is exposed to a force in excess of a predetermined value, said base member fractures at its thinned region permitting the mirror, the supporting arm and the portion of the base member enclosed by the grooves to break away from the remaining portion of the base member, said means for joining the remaining portion of the base member to the

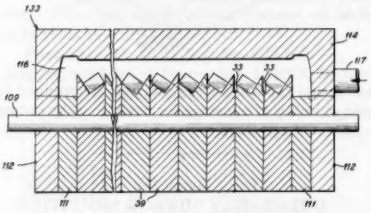
external support comprising: a plurality of coaxial apertures through said enlarged arm portion, the remaining portion of the base member and the external support; and bolting means located within said apertures, said apertures in the enlarged arm portion having dimensions greater than those of the bolting means therein.

4,066,236

CUBE CORNER TYPE RETROREFLECTOR BODIES AND MOLDS MADE THEREWITH

Henry Lindner, Elgin, Ill., assignor to Beatrice Foods Co., Elgin, Ill.

Filed June 25, 1976, Ser. No. 699,959
Int. Cl.² B41B *11/54*
U.S. Cl. 249—160 **19 Claims**



1. An element for incorporation into a mold adapted for molding cube corner type retroreflectors comprising -

A. an elongated slab-shaped body having spaced, generally parallel respective side walls with connecting edge walls and end walls;

B. one edge wall having defined therein a plurality of cube corner retroreflective units arranged in a row which extends lengthwise along said one edge wall,

C. each cube corner retroreflective unit being defined by three flat faces which are arranged circumferentially about an optical axis extending therethrough, all such faces being inclined at a similar angle relative to said optical axis, and all such faces meeting an apex point along said optical axis, the interrelationship between said faces and the associated said optical axis for each unit being such that a ray of incident light striking the predetermined surface of a body molded over said one edge wall and striking one of such faces in each unit molded in such molded body but within a predetermined range of angles relative to said optical axis as formed in said molded body is deflected successively against the other two said faces in such molded body and then is substantially retroreflected away from such cube corner retroreflective unit in such molded body,

D. each respective such optical axis of all said retroreflective units being disposed substantially parallel to the respective other such optical axes of such cube corner reflective unit plurality, and

E. each respective such apex point of each said cube corner retroreflective unit being substantially coplanar with the respective other such apex points of said cube corner reflective units comprising said plurality.

4,066,237

ADJUSTABLE FORM STAKE ASSEMBLY

Jack Bentz, 1904 N. 26th, Boise, Idaho 83702

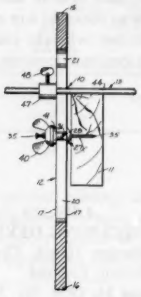
Filed Sept. 16, 1976, Ser. No. 723,942
Int. Cl.² E01C *19/50*
U.S. Cl. 249—213 **6 Claims**

1. An adjustable form support stake assembly, comprising:

an elongated stake having opposed sides and a point at a lower end and a striking surface at an upper end;

an elongated slot formed through the stake and extending longitudinally therein from an upper slot end adjacent the striking surface to a lower slot end upwardly spaced from the stake point;

a carriage bolt having a headed end of larger dimension than the width of the slot for abutment with one side of the stake and a threaded shank slidably received by and projecting through the slot to a free end outwardly adjacent to the stake;



open bore means extending through the carriage bolt from the free shank end to the headed end for receiving the shank of a nail; and

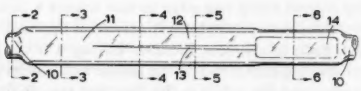
a nut threadably mounted to the free end of the threaded shank for abutment with the remaining side of the stake to selectively clamp the carriage bolt securely to the stake.

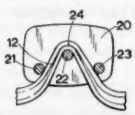
4,066,238

MEANS FOR CONTROLLING FLUID FLOW

Ellis Whiteside Clarke, 47 Deramore Drive, Belfast, BT9 5JS, Northern Ireland

Filed Jan. 19, 1976, Ser. No. 650,360
Claims priority, application United Kingdom, Jan. 17, 1975, 2069/75
Int. Cl.² F16K *7/04*
U.S. Cl. 251—6 **13 Claims**





1. Means for controlling fluid flow comprising a body defining a passageway having opposed flexible walls which for at least a portion of the axial length of the body are capable of being held in mutual contact throughout their cross-section except for a limited region, this region being a cross-sectional flow area which varies along the general direction of flow through the passageway, and flexing means operative to retain the body in a predetermined flexed state such that the walls are held in contact, over a localised area of limited axial length, due at least in part to the internal stresses set up in the body arising from the flexure of the body rather than to external clamping forces applied to the opposite sides of the walls immediately adjacent to said area, said flexing means being

arranged that said body can be moved lengthwise relative to the flexing means so as to alter the position of said localised area while the body is maintained in said flexed state.

4,066,239

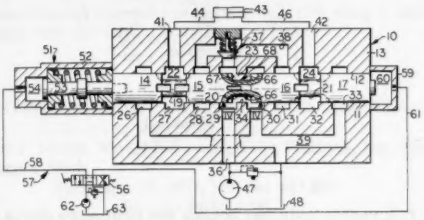
METERING SLOT CONFIGURATION FOR A VALVE SPOOL

Lowell R. Hall, Elwood, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 664,443, March 8, 1976, abandoned. This application Mar. 16, 1977, Ser. No. 778,278

Int. Cl.[2] F15B *13/042*; F16K *47/04*

U.S. Cl. 251—31 **3 Claims**



1. A fluid control valve comprising:

a body having a pump inlet port and a drain outlet port formed therein and being of a construction sufficient for connecting the pump inlet port to a relatively high pressure pump and the drain outlet port to a substantially atmospheric pressure reservoir; and

a valve spool having a longitudinal axis, first and second lands, a reduced diameter portion positioned between the first and second lands and a metering slot leading from a peripheral surface of the first land movable a peripheral surface of the second land, said metering slot including a substantially cylindrical pocket recessed into the second land and generated about an axis disposed at an acute angle relative to the longitudinal axis, and a groove formed in the first land and the reduced diameter portion connecting the peripheral surface of the first land with the cylindrical pocket, said groove having an arcuate surface portion leading from the peripheral surface of the first land and an alongated bottom surface portion positioned substantially parallel to the longitudinal axis and tangent to the arcuate surface portion, said spool being movably along its longitudinal axis between a first position at which fluid flow from the pump inlet port to the drain outlet port is metered outwardly relative to the spool through the cylindrical pocket and a second position at which fluid flow from the pump inlet port to the drain outlet port is metered inwardly through the groove, said metering slot being of a construction sufficient for directing the fluid metered inwardly through the groove into the cylindrical pocket to generate a force acting on the spool tending to close the metering slot.

4,066,240

SELF COMPENSATING SEAT FOR A SPHERICAL PLUG VALVE

Eulas R. Atkinson, Conroe, and Willard E. Kemp, Houston, both of Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed June 1, 1976, Ser. No. 691,737

Int. Cl.[2] F16K *25/00*

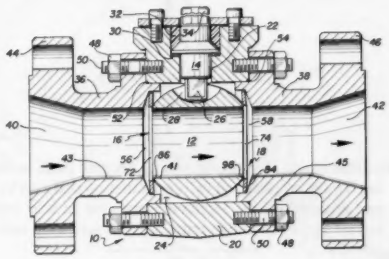
U.S. Cl. 251—175 **10 Claims**

1. A ball valve, comprising:

a. a valve body having inlet and outlet flow passageways and a valve chamber therebetween, a ball member having a passageway therethrough mounted in said valve chamber for rotation between open and closed positions of said ball member passageway relative to said inlet and outlet flow passageways;

b. said valve chamber being located at the junctures of said flow passageways and having opposed end walls extending generally radially outwardly from said passageways;

c. a one piece deformable annular metallic seal ring of a uniform generally rectangular cross-section positioned in said valve chamber around each of said inlet and outlet passageways to form upstream and downstream seal rings, said generally rectangular seal rings each having a relatively sharp inner edge portion in a substantially line sealing contact area with said ball member and in a spaced relation to the adjacent chamber end wall in a preloaded position, said seal rings each having an inner relatively large ball contact surface immediately adjacent the line contact area and out of contact with said ball member in preloaded position, each seal ring has an outer peripheral edge portion in sliding contact with the associated end wall such that said outer peripheral edge portion will slide on said associated end wall upon displacement of said ball



member from one position to another as said ball member moves in general longitudinal alignment with said inlet and outlet flow passageways;

d. the downstream seal ring upon positioning of said ball member in said closed position and displacement of said ball member downstream by fluid pressure to a pressure loaded position being pivoted generally about said outer peripheral edge portion with said outer peripheral edge portion sliding radially inward relative to the associated flow passageway and with the inner edge portion thereof being moved into contact with the adjacent chamber end wall and with said inner ball contact surface being moved into contact with said ball member to provide a relatively large contact area between the surface of said ball member and said downstream seal ring, said valve chamber end wall being spaced from said ball valve member a predetermined distance in said preloaded position such that displacement of said ball valve member from said preloaded position to said pressure loaded position will not deform said annular seal ring beyond a point which will prevent it from returning to its original free shape.

4,066,241

SEAL MEANS FOR VALVE ASSEMBLY

Norman Weldon Read, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 548,065, Feb. 7, 1975, Pat. No. 4,022,427, which is a continuation-in-part of Ser. No. 494,424, Aug. 5, 1974, abandoned. This application Oct. 24, 1975, Ser. No. 625,786

Int. Cl.[2] F16K *11/02*

U.S. Cl. 251—361 **7 Claims**

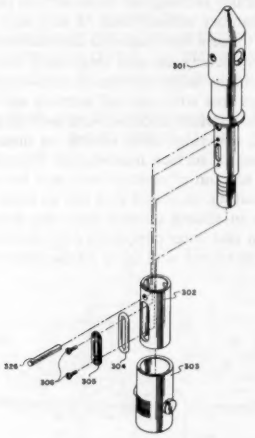
1. A seal assembly for providing a sealing valve action between two concentric, ported, tubular members, said seal assembly comprising:

a cylindrical seal carrier sleeve arranged for a snug slidable fit concentrically between two tubular members;

seal opening means passing through the wall of said carrier

sleeve and arranged to be placed in communication with ports in two tubular members;

elastomeric loop seal means adapted for snug fitting engagement inside said seal opening means and for sealingly engaging two tubular members; and,



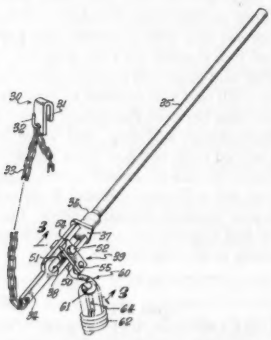
retention island means comprising arcuate plate means having similar surface curvature to that of said carrier sleeve and adapted for equi-spaced placement in said seal opening means in retaining abutment with said loop seal means.

4,066,242

GARAGE DOOR SPRING STRETCHING DEVICE

Louis Allevato, 2928 Sisal Place, Hacienda Heights, Calif. 91745

Filed Mar. 18, 1977, Ser. No. 779,275
Int. Cl.[2] B25B *27/00*; E05F *1/12*
U.S. Cl. 254—10.5 **11 Claims**



1. A garage door spring stretching device for assisting in the installation of a garage door spring of the type useful on garage door support assemblies having a bracket affixed to the side frame of the garage opening, said device comprising:

hook means having a bracket engaging member, said bracket engaging member having means adapted to fit a chain means;

chain means affixed to said bracket engaging member;

lever means having an attachment end and a handle end, said lever means being connected to said chain means at said attachment end;

slot means located in said lever means near the attachment end thereof; and

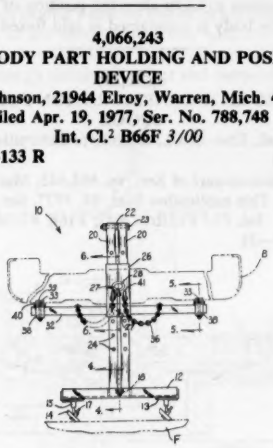
spring engaging means slidably held in said slot means.

4,066,243

VEHICLE BODY PART HOLDING AND POSITIONING DEVICE

Edmond L. Johnson, 21944 Elroy, Warren, Mich. 48089

Filed Apr. 19, 1977, Ser. No. 788,748
Int. Cl.[2] B66F *3/00*
U.S. Cl. 254—133 R **4 Claims**



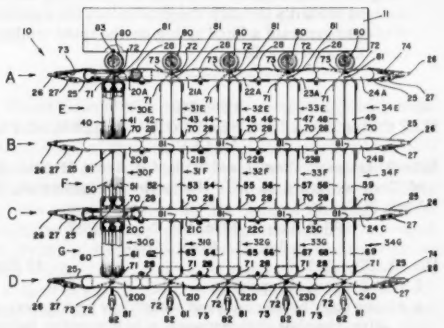
1. A vehicle body part holding and positioning device comprising a floor supported rollable frame, a pair of side by side pipes supported in an upright position on said frame, a second pair of pipes lengthwise joined together, said second pair of pipes encircling said first-mentioned pair of pipes and being vertically slideable thereon, a pair of widthwise spaced apart arms for holding and cradling thereon a vehicle body part, means holding said arms fast to said second pair of pipes for movement therewith, said holding means disposing said arms over said frame so that the center of weight of said vehicle body part coincides with the center of length of said frame, means on said frame for engaging the foot end of a friction jack, means on said second pipes for engaging the moveable head of said jack, whereby the jack can be operated to lift said vehicle body part above said frame, and means for holding said second pipes elevated on said first pipes without the use of said friction jack, whereby the device can be rolled to hold and position said vehicle body in respect to a vehicle body during assembly or disassembly thereof.

4,066,244

VEHICULAR ENERGY ABSORBER

Leland E. Yoho, Uniontown, Ohio, assignor to Glenn Fisher, Akron; Warren G. Yoho, Jacobsburg and Leland E. Yoho, Uniontown, all of, Ohio, part interest to each

Filed Sept. 20, 1976, Ser. No. 724,980
Int. Cl.[2] E04F *13/00*
U.S. Cl. 256—1 **12 Claims**



1. Apparatus for absorbing the impact of a collision of a

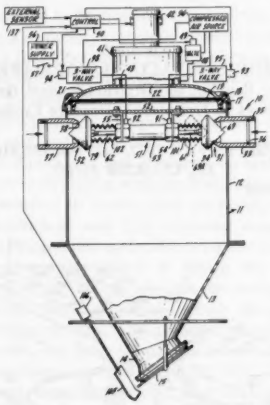
moving vehicle with a hazard comprising, at least two rows of upright adjacent toroidal members extending in planes generally transverse to the expected direction of impact, the first of said rows being generally adjacent the hazard and the last of said rows being positioned to receive the contact of the vehicle, means to connect each said toroidal member in a said row to its adjacent toroidal member in said row, a line of toroidal members between each said row of toroidal members, the toroidal members of said line extending in a direction generally longitudinally of the expected direction of impact and in planes generally parallel thereto, and additional means to connect each said line of toroidal members to it adjacent rows of toroidal members to form an integral network of permanently connected toroidal members to absorb the impact of a collision with a moving vehicle and with the toroidal members in each line engaging the toroidal members in each row along a chordal plane thru the torus.

4,066,245

CONTROL FOR HOPPER LOADER FOR GRANULAR MATERIALS

Gilbert F. Shultz, Novi, Mich., assignor to Whitlock, Inc., Farmington, Mich.

Filed Apr. 30, 1976, Ser. No. 681,851
Int. Cl.[2] B01F *5/00*
U.S. Cl. 366—139 **11 Claims**



1. A control circuit for a vacuum hopper loader of the kind comprising a hopper having an air port at the top of the hopper, a filter extending across the air port, a plurality of material inlet ports located below the filter, individual electrically actuated material fill control valves for opening and closing the material inlet ports, and air supply means for supplying air under pressure to the air port, and evacuation means connected to the air port, comprising:

blowback timer means for developing a blowback enabling signal for a predetermined time interval T2;

blowback signal generator means for developing a blowback actuating signal comprising a series of pulses, including means for adjusting the period of such pulses;

blowback gate means, connected to the blowback timer means and blowback signal generator means and to the air supply means, for actuating the air supply means to apply a series of pulses of air through the filter into the hopper during the time interval T2;

fill timer means for developing a fill enabling signal for a predetermined time interval T3;

fill signal generator means for developing a repeating sequence of fill actuating signal pulses, one pulse for each fill control valve, including means for adjusting the relative durations of the fill actuating signal pulses;

fill vacuum coupling means for actuating the evacuation means to evacuate the hopper continuously during time interval T3;

fill logic means connected to the fill timer means, the fill signal generator means, and the fill control valves to open the control valves in repeating sequence during time interval T3;

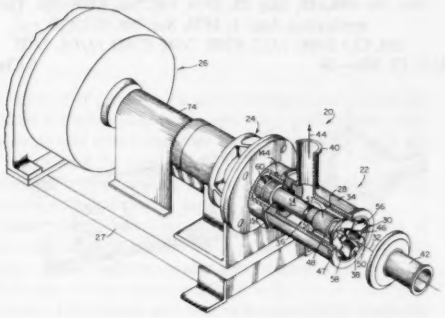
and control sequence coupling means interconnecting an input of one of the timer means to an output of the other timer means to set the one timer means in response to timing out of the other.

4,066,246

SANITARY PIPELINE MIXER

Harald Olaf Korstvedt, Brookline, Mass., assignor to J. W. Greer, Inc., Hudson, N.H.

Filed Dec. 18, 1975, Ser. No. 641,973
Int. Cl.[2] B01F *7/02*
U.S. Cl. 366—293 **4 Claims**



1. A sanitary pipeline mixer comprising:

a. a mixing head including a turbine housing having an inlet port, an internal mixing chamber and an outlet port, rotor means and stator means disposed within said turbine housing for directing a fluid through said inlet port, said mixing chamber and through said outlet port; and

b. a seal assembly including a seal housing, a double flushed mechanical seal disposed within said seal housing;

c. said turbine housing provided with a flange about said mixing chamber, said seal housing provided with a flange, said turbine housing flange configured to matingly engage said seal housing flange and to form a substnatially frusto-conical male head therewith.

d. clamp means having a frusto-conical female socket configured to engage said frusto-conical male head for clamping together said turbine housing and said seal housing, said double flushed mechanical seal constituting a positively biased seal for sealing said mixing chamber when said turbine housing and said seal housing are connected;

e. said stator means including first and second stators and said rotor means including first and second rotors, said first rotor and said first stator constituting a primary stage, said second rotor and said second stator constituting a secondary stage, said first rotor means and said second rotor means are rotatable about a common axis, said first stator having a cylindrical body formed with a conical socket and a plurality of arcuately disposed passages parallel to said axis of rotation, said first rotor having a plurality of blades, each of which constitutes a forwardly extending blade which is offset from the rotational axis of said first rotor and is disposed in a plane that intersects the rotational axis of said first rotor, said second stator having a cylindrical body formed with a conical socket and a plurality of arcuately disposed passages in concentric rows, said second stator passages parallel to said axis of rotation, the diameter of any one second stator passage in

any one row having like diameters, said second stator passages having a decreasing diameter from an outer forward end of said conical socket to an inner rearward end of said conical socket, said second rotor having a plurality of blades, each of which constitutes a forwardly extending blade which is offset from the rotational axis of said second rotor and is disposed in a plane that intersects the rotational axis of said second rotor.

4,066,247

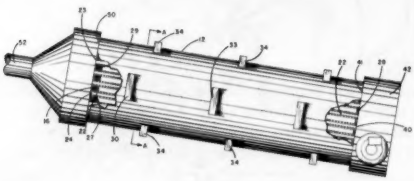
MIXING APPARATUS

Robert L. Mendenhall, 1770 Industrial Road, Las Vegas, Nev. 89102

Continuation-in-part of Ser. No. 487,927, July 12, 1974, abandoned, and Ser. No. 487,928, July 12, 1974, abandoned, and Ser. No. 488,518, July 15, 1974, Pat. No. 4,000,000. This application Aug. 1, 1975, Ser. No. 601,176

Int. Cl.[2] B28C *1/22;* **F28F** *7/00;* **F28D** *11/06, 7/00*

U.S. Cl. 366—24 **5 Claims**



1. In a heating and mixing apparatus comprising an elongated drum having a plurality of heating tubes extending along the interior length thereof and end walls at opposite ends of said drum and between which walls said tubes extend said drum being tilted with respect to horizontal with means for introducing composition adjacent one drum end and removing it adjacent the opposite end, and means for rotating said drum whereby said composition is drawn from one end to the other by gravity as said drum is rotated, the improvement comprising at least one support device disposed in said drum intermediate said end walls having at least one opening therein to allow composition to pass therethrough, each support device having a portion extending through an opening in said drum and exposed exteriorly of said drum, a plurality of orifices through which said tubes extend, and means for mechanically vibrating the exteriorly exposed support device portion.

4,066,248

CHARGING DEVICE

Bernhard Hoffmeister, and Wilhelm Schwarz, both of Wilhelmshaven, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

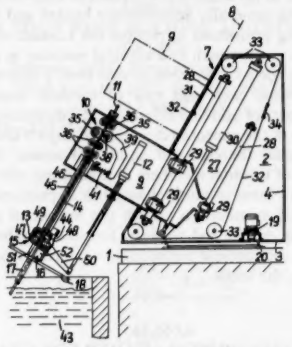
Filed Dec. 14, 1976, Ser. No. 750,528

Claims priority, application Germany, Feb. 27, 1976, 2607947

Int. Cl.[2] C22B *9/10*

U.S. Cl. 266—216 **9 Claims**

1. A device for supplying charge material in the form of wire to a metal melt which comprises; a frame, a feed pipe in the frame extending into the melt from above, feed means carried by the frame and operable for withdrawing the charge material from a supply thereof and for feeding the material into said feed tube at the upper end thereof, the supply of charge material including means in said frame for rotatably supporting a reel of the material, a rotary drive member engaging the surface of the material wound on said reel, and means for driving said drive member in rotation.



4,066,249

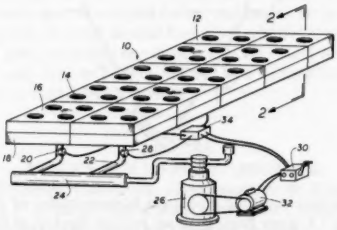
MODULAR VACUUM WORK AREA

John G. Huber, Sayville, and Ottavio Gianuzzi, Baldwin, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed May 11, 1977, Ser. No. 795,918

Int. Cl.[2] B25B *11/00*

U.S. Cl. 269—21 **3 Claims**



1. A work table to use a vacuum to hold an object to a surface for subsequent working, said table comprising:

a top plate forming the surface on which the object may rest, said top plate having a limited number of openings of a predetermined size therethrough;

a honeycomb having cores underlying said, top plate said honeycomb having the majority of its cores closed on one end by said top plate and a limited number of the cores under the openings therethrough;

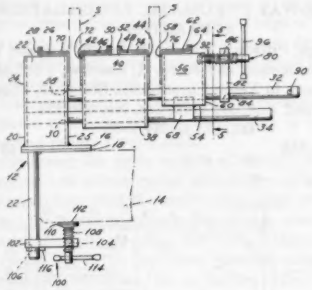
a support plate for said honeycomb which closes the other end of said cores save for the limited number equal to the area of and underlying said openings of said top plate; and

an orifice plate under said support plate with a port connected to a vacuum source to provide a holding pressure in the limited number of honeycomb cores and at the top plate openings, said port having a restricted orifice in registry with the cores exposed by said support plate whereby the area of vacuum is enlarged from that of the restricted orifice to that of said limited number of cores and thus the top plate openings while air flow is controlled by the restricted orifice at the port to the vacuum source.

4,066,250
SKI CLAMPING APPARATUS

James B. Campbell, 5215 Arden, Warren, Mich. 48092

Filed Dec. 8, 1976, Ser. No. 748,493
Int. Cl.[2] B25B *1/20*
U.S. Cl. 269—43 14 Claims

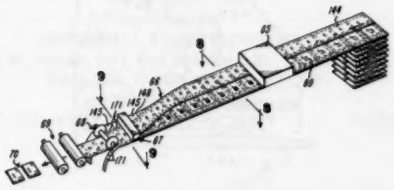


1. A clamp adapted to be mounted on a support comprising a support flange, a stationary clamping member secured to said support flange, a first elongated mounting element secured to and extending to one direction from said stationary clamping member, a first movable clamping member provided with an opening through which said elongated mounting element extends, each of said stationary and first clamping members having a first abutment, the first abutment on said stationary clamping member cooperating with the first abutment on said first clamping member to form a first clamping section for supporting a workpiece, said first clamping member being movable on said first mounting element towards or away from said stationary clamping member to clamp the workpiece between said first abutments or to release the workpiece from between the first abutments, a second movable clamping member provided with an opening through which said first mounting element extends, said first clamping member being located between said stationary clamping member and said second movable clamping member, each of said first and second clamping members having a second abutment, the second abutment on said first clamping member cooperating with the second abutment on said second clamping member to form a second clamping section for supporting another workpiece, said second clamping member being movable on said mounting element towards or away from said first clamping member to clamp the workpiece between said second abutments or to release the workpiece from between said second abutments, and releasable fastening means carried by said mounting element engageable with said second clamping member for maintaining the workpieces between the cooperating abutments of said first and second clamping sections, said releasable fastening means including a locking bracket having a pair of openings, with one bracket opening being threaded and the other bracket opening being non-threaded, with the non-threaded opening of the locking bracket being sleeved over said first mounting element whereby said bracket is freely movable along said first mounting element during adjustment of said releasable fastening means, said releasable fastening means including aa threaded member which is threadedly received in said threaded opening in said bracket, said second clamping member including an opening which receives and carries one end portion of said threaded member and the other end portion thereof being provided with a handle for rotating said threaded member.

4,066,251
CONTINUOUS BUSINESS FORM OR THE LIKE ADAPTED FOR SUBSEQUENT PROCESSING INTO COMBINATION MAILING ENVELOPES AND RETURN ENVELOPES HAVING A COMMON BACK PLY PANEL

Edward L. Johnsen, 12 Fox Meadow Lane, Wayland, Mass. 01778

Continuation of Ser. No. 593,987, July 8, 1975, abandoned, which is a division of Ser. No. 433,462, Jan. 15, 1974, abandoned. This application Jan. 25, 1977, Ser. No. 762,380
Int. Cl.[2] B41L *43/12*
U.S. Cl. 270—37 9 Claims



1. A method of producing a series of interconnected blanks each suited for subsequent processing into a combination mailing envelope and return envelope having a common back ply panel, comprising the steps of:

a. continuously advancing a first endless web of material toward an accumulating station;

b. transversely subdividing said first web into a series of elongate interconnected subdivisions each having the longitudinal direction of said subdivisions corresponding to the transverse direction of said web;

c. forming foldlines on said web to longitudinally subdivide each of said interconnected transverse subdivisions into at least three panels, said panels extending transversely of said web to span the width thereof, with one panel defining a front ply panel of the mailing envelope, another panel defining a back ply panel common to both the mailing and return envelope, said front and back panels being non-abutting, and a third panel of which forms a discardable panel and connects said front and back panels together;

d. forming a further foldline on said web to be located on said discardable panel between the edges thereof, said foldline extending longitudinally of said web continuously for essentially the entire length of said web;

e. selectively applying adhesive to adjacent at least three outer marginal edges of an upper surface of said front and back ply panels;

f. continuously advancing a second endless web of material of a width approximating the width of said back ply panel toward an accumulating station;

g. transversely subdividing said second web into a series of interconnected subdivisions, each of which defines a front ply panel of the return envelope;

h. collating said advancing second web with said advancing first web for disposing three marginal edges of each front ply panel of the return envelope in registered overlying relationship with said three marginal edges of a corresponding back ply panel, generating the series of interconnected blanks;

i. folding said front panel over into juxtaposed relationship with said discardable panel;

j. accumulating said series of interconnected blanks for subsequent processing;

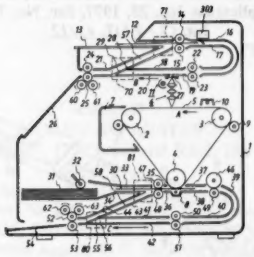
k. moving said front ply panel from juxtaposed relationship with said discardable panel into over-lying relationship with said second web; and

l. removing said discardable panel from said web.

4,066,252
COPYING APPARATUS

Richard Wick, Munich, Germany, assignor to AGFA-Gevaert, AG, Leverkusen, Germany

Filed May 11, 1976, Ser. No. 685,161
Claims priority, application Germany, May 16, 1975, 2521932
Int. Cl.[2] B65H 5/22
U.S. Cl. 271—3 6 Claims

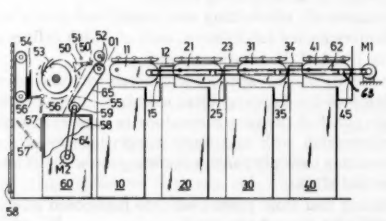


1. A copier, particularly for selectively copying one or both sides of a sheet-shaped original onto one or both sides of a copy sheet, comprising first means defining a first endless path for travel of said original and having a first inlet and a first outlet through which the original issues; second means defining a second endless path for travel of said copy sheet and having a second inlet and a second outlet through which the copy sheet issues; third means located at a copy station intermediate the respective inlets and outlets and operative for reproducing an image from either of said sides of said original onto either of said sides of said copy sheet; and fourth means for transporting said original and said copy sheet, respectively, in their associated paths, and for selectively turning the respective sheets side-for-side for renewed travel in their paths past said copy station, said fourth means including transporting elements mounted outwardly adjacent the respective outlets of said paths, and means for selectively reversing the transporting direction of said transporting elements when the respective sheets are to be reversed so as to return such sheets into the respective endless path.

4,066,253
APPARATUS FOR DISPENSING BANKNOTES, TICKETS OR THE LIKE

Leif Jorgen I. Lundbald, Huddinge, and Jan Olof Ek, Alvsjo, both of Sweden, assignors to Inter Innovation AB, Stockholm, Sweden

Filed Nov. 30, 1976, Ser. No. 746,029
Claims priority, application Sweden, Dec. 2, 1975, 7513557
Int. Cl.[2] B65H 5/22
U.S. Cl. 271—4 8 Claims

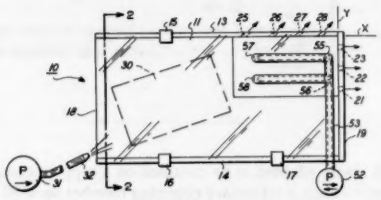


1. An apparatus for discharging banknotes or the like, said apparatus having a dispensing aperture accessible to customers from the apparatus exterior, a number of banknote magazines within said apparatus, feeding means for feeding banknotes from said magazines to the dispensing aperture, detector and counter means for detecting banknotes possibly fed out two-fold and for counting dispensed banknotes, the improvement comprising: said feeding means comprising separate feeders operatively associated with respective magazines, means for incorporating said separate feeders in a series banknote feeding path for banknotes from said magazine in common and along said series path toward a junction common to all said magazines and upstream of said dispensing aperture.

4,066,254
THREE-WAY PNEUMATIC REGISTRATION APPARATUS

Klaus K. Stange, Pittsford; Richard E. Smith, Webster; Thomas J. Hamlin, Macedon, and James R. Cassano, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 28, 1975, Ser. No. 636,336
Int. Cl.[2] B65H 9/00
U.S. Cl. 271—236 13 Claims



1. Apparatus for registering a sheet with respect to perpendicularly related axes, the sheet having a length and width within predetermined ranges, comprising:

a. a sleeve for internally accommodating said sheet, at least one point on an inner narrow wall of the sleeve being coincident with one of the axes;

b. a stop located at one end of the sleeve, the stop having at least one point coincident with the other of the axes;

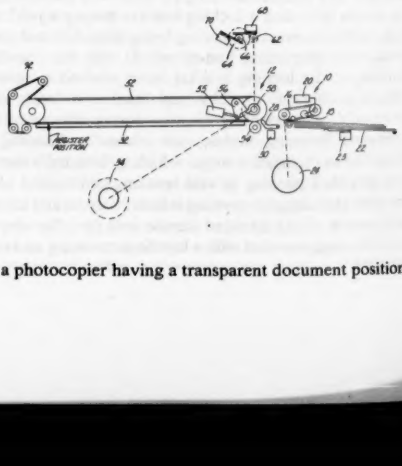
c. means for providing in the sleeve a fluid stream having velocity components normal to each of the axes, said means including at least one port in said stop and at least one port in said narrow wall, whereby when a sheet is placed in the sleeve, the stream moves the sheet into abutment with each of said points; and

d. fluidic means for driving a sheet in contact with said points into abutment with a wide wall of the sleeve, thereby additionally registering the sheet against said wide wall.

4,066,255
DOCUMENT TRANSPORT SYSTEM

Wilburn F. Bradbury, Northbrook, Ill., assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed July 23, 1976, Ser. No. 708,052
Int. Cl.[2] B65H 5/02
U.S. Cl. 271—265 2 Claims



1. In a photocopier having a transparent document position-

ing table, first and second spaced belt guides positioned above said table, a belt reeved over said guides with the bottom run resting on said table and a return run extending between the tops of said guides, said belt forming an entrance nip as it loops over said first guide to the table surface,

the provision of a drive system for said belt to cause said belt to first move a sheet presented to the entrance nip to an exposure station on said table, to pause, and then resume moving to initiate exit of the sheet, comprising:

a rotatable power driven shaft connected to said belt to drive said belt;

means to sense presentation of the lead edge of a sheet to said nip and to initiate rotation of said power driven shaft and the resulting belt drive motion in response thereto;

a circuit control means for:

1. assuming control of said belt drive motion from said means to initiate rotation in response to initial rotation of said power driven shaft;
2. continuing the drive motion of the belt for a predetermined belt advancement across the table sufficient to have transported the sensed lead edge of a sheet from said nip to a predetermined lead edge position for exposure, and then stopping the drive at that position; and
3. reinstating drive motion of the belt subsequent to an exposure sequence, for a further travel sufficient to have transported a sheet off of the exposure station.

4,066,256

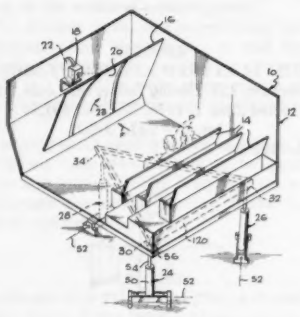
AMUSEMENT RIDE

Douglas Trumbull, Santa Monica, Calif., assignor to Future General Corporation and Standard Alliance Industries Inc., both of Los Angeles, Calif.

Filed Nov. 17, 1975, Ser. No. 632,222

Int. Cl.[2] A63G *31/16*; G09B *9/00*

U.S. Cl. 272—18 **2 Claims**



1. An amusement ride apparatus, comprising:

a passenger-holding frame;

image means including screen means viewable by passengers in said frame, and means forming a predetermined motion picture image viewable by looking at said screen means and representing the veiw from a moving vehicle; and

drive means for selectively moving each of a plurality of spaced locations on said frame vertically to change the position of said passenger-holding frame in synchronism with changes in said image, in a manner that generates resulting physical forces on occupants of said frame simulating at least some of the forces that would be applied to them in actual motion of the frame of the type depicted by said image, said image means being constructed to move with said passenger-holding frame;

said frame having a front portion nearest said screen means, a rear portion opposite said front portion, a pair of opposite sides, a centerline that lies halfway between said sides, and a vertical axis; and

said drive means incuding three primarily vertical hydraulic rams, a first of said rams located at said front portion of said frame near said centerline, and a second and third of said rams being located at said rear portion of said frame on opposite sides of said centerline;

each of said rams being tilted away from the vertical in the same direction rlative to outwardly and inwardly of the frame so that the upper ends of the rams are each spaced a predetermined distance from the vertical axis of the frame which is different than the spacing of the lower ends of the rams, from said axis, whereby each ram provides a small horizontal force to the frame which is always in the same direction.

4,066,257

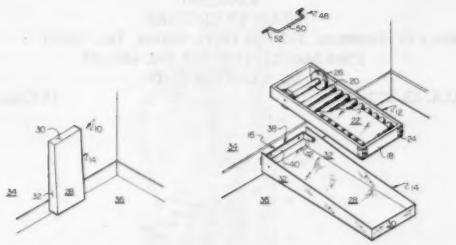
TREADMILL EXERCISING DEVICE

Bynum W. Moller, P.O. Box 688, Kerrville, Tex. 78028

Filed Nov. 7, 1975, Ser. No. 629,909

Int. Cl.[2] A63B *23/06*

U.S. Cl. 272—69 **8 Claims**



2. An exercise device comprising; an endless belt treadmill; means mounting said treadmill for movement between a generally horizontal operative position and an upright storage position; a cabinet having a front wall positioned generally parallel to said endless belt for concealing said treadmill when in said storage position and an open back exposing said treadmill when in said operative position; and means for mounting said cabinet for movement between a first position exposing said treadmill in said operative position and a second position concealing said treadmill when in said upright position.

4,066,258

SEAT FOR A CHILD'S SWING

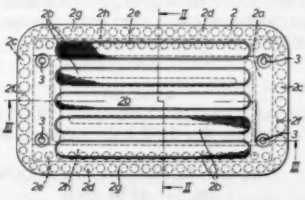
Victor Horace Yates, Shelley, near Huddersfield, England, assignor to The Sutcliffe Engineering Holdings Limited, Ossett, England

Filed Feb. 23, 1976, Ser. No. 660,433

Claims priority, application United Kingdom, Mar. 6, 1975, 9361/75

Int. Cl.[2] A63G *9/00*

U.S. Cl. 272—85 **23 Claims**



1. A seat for a child's swing, the seat being of composite structure comprising a generally rectangular substantially laminar first member, which is sufficiently rigid to bear the weight of a child, and a second member made of a compressible polymeric material covering the entire peripheral edge of the first member, there being:

apertures all of the same diameter extending along both of a first pair of opposite sides of the second member,

apertures all of the same diameter, greater than the diameter of the apertures in said first pair of opposite sides, extending along a second pair of sides of the second member,

a respective row of further circular cross-section blind apertures all of the same diameter provided in each of the parts of the second member forming the first pair of sides, said further row of blind apertures being parallel to the corresponding first-mentioned row of apertures, the diameters of said further apertures being less than the diameters of the apertures in the corresponding first rows of apertures, and their centres being off-set with respect to the centres of the apertures in the corresponding first rows of apertures, wherein the force-deflection characteristic of the second member is such that, on impact with an object, the second member initially deforms to conform with the shape of the impacted object and then deforms further to absorb the main energy of the impact.

4,066,259

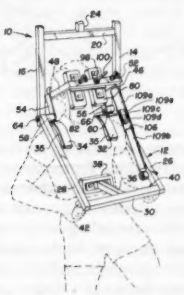
NECK EXERCISER

Jerry D. Brentham, 102 Elm Drive, Belton, Tex. 76513

Filed May 13, 1976, Ser. No. 686,164

Int. Cl.[2] A63B *21/00*

U.S. Cl. 272—94 **15 Claims**



13. A neck exercising device comprising: a general frame; a rigid head engaging pad support frame; means pivotally securing said rigid head engaging pad support frame to said general frame; head engaging pads; means securing said head engaging pads to said rigid head engaging pad support frame; actuated means pivotally secured between the general frame and the rigid head engaging pad support frame, such that pivotal movement of the head of the user moves said rigid head engaging pad support frame and movement of said rigid head engaging pad support frame is resisted by said actuated means; and restraint means projecting from said general frame, said restraint means including a rigid portion adapted to transmit a force to the body of the user to prevent movement of the head relative to the body of the user except where that movement in turn causes movement of the rigid head-engaging pad support frame relative to the general frame.

4,066,260

METAL-PLASTIC COMPOSITE RACQUET

Robert E. Rodgers, Jr., 5455 Loch Lomond, Houston, Tex. 77096

Filed Oct. 15, 1976, Ser. No. 732,656

Int. Cl.[2] A63B *49/10*

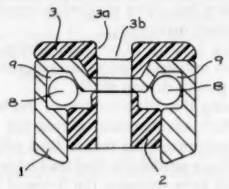
U.S. Cl. 273—73 C **7 Claims**

1. In a game racquet;

a composite metal and plastic frame defining a stringing section and a handle;

the composite frame comprising a unitary substantially rectangular extruded metal channel member having in cross-section, an "M" configuration, the outer side walls of which are substantially parallel, said metal channel member having a closed top outer section and a partially closed bottom inner section, the lower edges of the side walls of the metal channel member having an integral continuous reinforcing and thickening rib along the inner surfaces thereof partially closing said bottom section of the metal channel member and imparting rigidity to the composite frame;

an extruded plastic core member mounted within and bonded to the lower inside surface and the inner surface of the side wall reinforcing ribs of the metal channel member



to form a unitary frame, the outer surface of the plastic core being substantially encased by the metal channel member and so dimensioned as to leave a space between the side walls of the metal channel member and the plastic core for the reception of a weighting material;

a reinforcing throat piece attached to and imparting rigidity to the frame; and a plastic bumper strip covering the outer surface of the metallic frame member, stringing holes passing through the bumper strip and the composite frame, the plastic bumper strip having a central groove to receive and protect the stringing from abrasion.

4,066,261

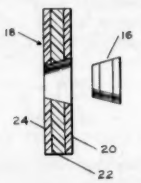
MULTI-LAYERED ARCHERY TARGET

Marvin L. Stewart, 113 Elbring Drive, St. Louis, Mo. 63135

Filed June 1, 1976, Ser. No. 691,547

Int. Cl.[2] F41J *3/00*

U.S. Cl. 273—102 B **2 Claims**

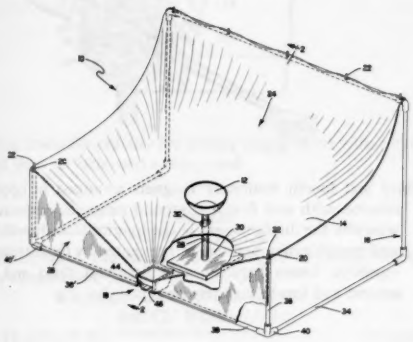


1. An archery target having relatively lightweight and self-closing of arrow hole characteristics, said target being comprised of three separate layers constituting a first front layer of expanded polyethylene, said first layer having a substantial thickness and mass to provide a major arrow stopping characteristic, a second intermediate layer of relatively lightweight expanded polystyrene and a third rear layer of expanded polyethylene of substantial thickness, said expanded polyethylene having the capacity to close arrow holes therethrough, the intermediate layer of expanded polystyrene being substantially thicker and lighter than either of the layers of expanded polyethylene, the layers of expanded polyethylene having a thickness of about one inch and a density of about 6 pound per cubic foot and the layer of expanded polystyrene having a thickness of about two inches and a density of about 2 pounds per cubic foot.

4,066,262
GAME TARGET FOR PROJECTILES

Arthur A. Stiefel, 5200 Gulf Drive, No. 207, Holmes Beach, Fla. 33510

Filed Mar. 4, 1976, Ser. No. 663,950
Int. Cl.[2] A63B *71/04*
U.S. Cl. 273—105 R 9 Claims



1. A game apparatus for receiving tossed playing cards, comprising:

a backdrop;

a quadrilateral collection receptacle having a mouth for collecting and stacking playing cards landing on said backdrop, said backdrop having a first aperture located at a lower, forward end portion thereof, said backdrop being downwardly sloped with the first aperture thereof being configured to and contiguous with said mouth of said receptacle;

said collection receptacle having an access opening at a front surface thereof, the access opening having a width corresponding to the width of a playing card;

a target for playing cards, said target being located above said receptacle and in proximity to said backdrop, an upper end of said backdrop extending above said target;

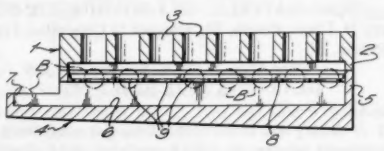
the slope of said backdrop being steep enough to overcome frictional resistance between said playing cards and said backdrop;

whereby playing cards passing above said target land on said backdrop and slide downwardly to be guided by said backdrop into said collection receptacle for removal as a stack through the access opening at the forward end portion of said backdrop.

4,066,263
APPARATUS FOR PLAYING A GAME

Salman Heskel Balas, Little Linden, Montecute Gardens, Tunbridge Wells, Kent TN4 8HG, and Clifton Quinton Keiller, Little Brook House, Ragged Dog Lane, Waldron, Sussex both of England

Filed May 17, 1976, Ser. No. 686,904
Claims priority, application United Kingdom, July 21, 1975, 30398/75
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—273 9 Claims

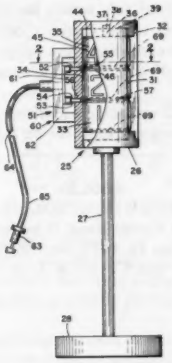


1. Apparatus for playing a game, comprising in combination a plurality of playing pieces and a playing device, said playing device having an upper board formed with a plurality of spaced openings, a lower board providing a playing piece collecting tray positioned below said upper board, and means arranged to support said playing pieces in a position between said upper and said lower boards and in positions corresponding to said openings in said upper board, wherein said playing piece supporting means comprises at least one sheet of resilient material having holes of a diameter which is slightly less than that of the diameter of said playing pieces, the relationship between said playing pieces and said playing piece supporting means being such that said playing pieces can be dislodged individually from their supported positions whereby they fall onto said lower board.

4,066,264
DRUM HALTING SYSTEM FOR GAME APPARATUS

Philip J. Rowman, Derry Road, Hudson, N.H. 03051

Filed Aug. 14, 1975, Ser. No. 604,593
Int. Cl.[2] A63F *5/04*
U.S. Cl. 273—143 R 1 Claim



1. In a game apparatus of the type having a housing with a window in the wall thereof and at least two numeral carrying drums rotatable in horizontal planes on a fixed vertical axis within said housing for displaying numerals in said window the combination of:

drum halting means for simultaneously halting all of said drums, without waiting for inertia to halt the same,

said means comprising juxtaposed, obtuse angled teeth on adjacent said drums and a plurality of halting detents each movable within said housing into engagement with the juxtaposed teeth of each two adjacent said drums to halt the same simultaneously,

and control mechanism extending from said halting detents to outside said housing, and operable from outside said housing to actuate said halting detents,

said control mechanism including a common yoke on the exterior of said housing from which said detents extend through the wall of said housing into the interior thereof,

and an elongated, push button, Bowden wire connection for actuating said common yoke,

whereby said control mechanism is visible and simple to present a tamper-proof appearance.

4,066,265
AMUSEMENT DEVICE

Kenneth A. Bredlau, 15675 LaBella Court, Morgan Hill, Calif. 95037

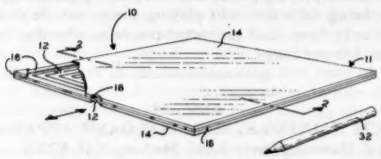
Filed Aug. 9, 1976, Ser. No. 712,782
Int. Cl.[2] A63F *9/06*
U.S. Cl. 273—153 R 2 Claims

1. An amusement device comprising in combination:

an envelope including a pair of mutually spaced walls defin-

ing therebetween a card-receiving space, each of said walls being formed of a substantially rigid transparent material and characterized by a pair of oppositely related planar surfaces;

a maze card having a pair of planar, oppositely related faces removably disposed between the walls of said envelope and characterized by indicia defining on the faces on integral maze comprising a labyrinth of contiguously related path segments visually apparent through each wall



of said pair of walls, first gate means joining contiguous path segments defined on faces of said card common thereto, and second gate means joining segments defined on opposite faces of the card for establishing a singular, obfuscated path extending from the periphery of the card to its center and passing at least once through the card; and

path tracing means including a marking device for applying removable tracing marks to the surfaces of said walls.

4,066,266

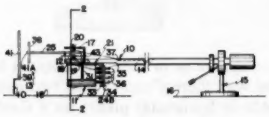
ATTITUDE CONTROL DEVICE

Frank C. Anley, 914 Valour Road, Winnipeg, Canada

Filed Jan. 21, 1977, Ser. No. 760,834

Int. Cl.² G11B *3/10*

U.S. Cl. 274—23 R **17 Claims**



1. An attitude control device a supporting surface means mounting said device on said supporting surface comprising in combination a main system and at least one subordinate system pivotally connected to said main system, said main and subordinate systems being free to move relative to each other and within limits, and means whereby the movement of said main system generates a complementary pre-determined movement of the subordinate system, said means including a magnetic element and a ferro magnetic programming strip element positioned to control the movement of said subordinate system, said magnetic element being secured to said subordinate system and the said ferro magnetic programming strip element being spaced from said one element and secured upon said supporting surface.

4,066,267

KNIFE-EDGE BEARING SYSTEM

Akira Kagata, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 11, 1976, Ser. No. 665,906

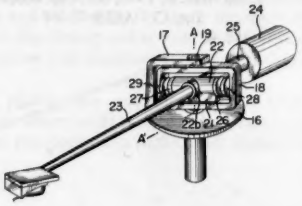
Claims priority, application Japan, Mar. 17, 1975, 50-36323[U]; Jan. 20, 1976, 51-5347[U]

Int. Cl.² G11B *3/10*

U.S. Cl. 274—23 R **5 Claims**

1. A knife-edge bearing system comprising a knife-edge member and a bearing member for receiving said knife-edge member, one of said members being stationary and the other member being movable,

first and second magnets attached to opposite ends of said movable member, and



third and fourth stationary magnets arranged in opposed relation with said first and second magnets, respectively whereby the displacement in the longitudinal direction of said movable member may be prevented by the interacting repulsive forces between said first and third and said second and fourth magnets respectively.

4,066,268

DISC RECORDING PROVIDED WITH LEGIBLE MATTER

Heinz Borchard; Gunter Grottker, both of Nortorf, and Peter Thun, Felde, all of Germany, assignors to TED Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec, Zug, Switzerland

Division of Ser. No. 353,766, April 23, 1973, abandoned. This application Feb. 10, 1975, Ser. No. 548,887

Claims priority, application Germany, Apr. 21, 1972, 2219520; Apr. 21, 1972, 151974[U]

Int. Cl.² G11B *3/00*

U.S. Cl. 274—42 R **4 Claims**

1. A record disc provided with a groove containing stored signals and with a nominally flat surface portion separate from the region containing stored signals and constituting a label portion carrying readable information, the improvement wherein the surface of said disc is provided, in said label portion, with a series of substantially circular, discontinuous grooves, with the discontinuities of all of the grooves forming a pattern constituting the readable information.

4,066,269

DUAL-MATERIAL SELF-BONDING LIP SEAL

Terry D. Linne, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

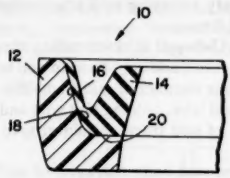
Filed Mar. 17, 1976, Ser. No. 667,769

Int. Cl.² F16J *15/32*; B32B *27/40, 27/12*

U.S. Cl. 277—228 **5 Claims**

1. A unitary seal in the form of a collar comprising an annular support section of a high modulus rigid plastic and an annular sealing section formed of an elastomeric material, said support and sealing section being directly bonded together with said sealing section extending radially inwardly from said

support section without the use of adhesive therebetween, said sealing section having an annular elastomeric lip thereof ex-

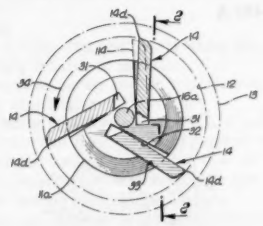


tending inwardly radially for sealing engagement with a cylindrical shaft to form said unitary seal.

4,066,270
NIPPLE CHUCK

Robert D. Elkin, Claremont, Calif., assignor to Collins Machinery Corporation, Monterey Park, Calif.

Filed Apr. 12, 1976, Ser. No. 676,051
Int. Cl.² B23B *31/40*
U.S. Cl. 279—2 R **13 Claims**



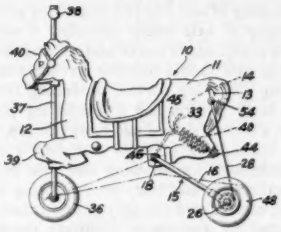
1. In pipe chucking apparatus,
a. an axially elongated tubular mandrel receivable within a bore formed by the pipe,
b. a plurality of jaws spaced about said mandrel axis at the mandrel exterior,
c. an axially elongated actuator extending radially inwardly of the jaws and axially within the mandrel, the actuator being operatively connected with the jaws and axially movable relative to the mandrel bodily to displace the jaws axially, and
d. structure on the mandrel supporting the jaws for radially outward displacement to engage the pipe bore in response to said axial displacement, and for subsequent limited rocking movement of the jaws circumferentially about said axis in response to rotation of the mandrel and jaws relative to the pipe.

4,066,271
TOY VEHICLE

Raymond J. Lohr, 5043 Sterrettania Road, Erie, Pa. 16506

Continuation-in-part of Ser. No. 635,583, Nov. 28, 1975, Pat. No. 3,999,771. This application Nov. 16, 1976, Ser. No. 742,087
Int. Cl.² A63G *19/08*
U.S. Cl. 280—1.182 **9 Claims**

1. A toy comprising,
a body,
said body having a front end and a rear end,
said rear end having a hollow therein,
a U-shaped rear frame having two legs and a transverse member connecting said legs,
said legs each having bearing means on the distal ends thereof,
an axle extending transversely of said toy and rotatably received in said bearing means,
two rear wheels,
said rear wheels being supported on said axle on the ends thereof and pinned against rotation thereon,
a one-way clutch,
said one-way clutch having an outer member and an inner member,
said inner member being fixed to said axle,
and means to allow said outer member to rotate in one direction relative to said inner member but restrained against rotation relative to said inner member in the other direction,
a drum surface on the outer periphery of said outer member,
a cable wrapped around said drum surface and extending upwardly and fixed to said body,
a return spring,
said return spring having one end attached to a said bearing and the other end fixed to said outer clutch member, urging said outer clutch member to rotate in a direction to wrap said cable on said drum surface,

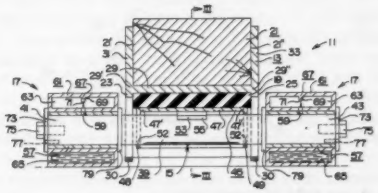


a crank member in said hollow,
one end of said crank member being fixed to said transverse member of said frame, the other end of said crank member extending upwardly, generally perpendicular to said legs,
a tension spring,
said tension spring being disposed in said hollow in said body and having one end fixed to said body and the other end connected to the distal end of said crank, whereby a load on said body causes said U-shaped frame to tend to rotate, exerting a tensile force on said spring and allowing said cable to wrap on said outer drum surface, said outer member of said one-way clutch,
said tension spring urging said legs to move downwardly, lifting said body whereby said clutch and said inner member with it, rotate, said axle pinned thereto, whereby said wheels are rotated in a forward direction with each cycle of movement downward and upward of said body.

4,066,272
DOLLY MEANS

Thomas A. Cobb, 3094 Sunrise St., Memphis, Tenn. 38127

Filed Jan. 21, 1976, Ser. No. 651,214
Int. Cl.² B62B *3/00*
U.S. Cl. 280—79.1 R **3 Claims**



1. Dolly means for use in moving heavy loads over a supporting surface, said dolly means comprising:
a. frame means, said frame means including an elongated bolster member for engaging the heavy load being moved,

said frame means including a first leg portion depending from a first longitudinal side of said bolster member, said frame means including a second leg portion depending from a second longitudinal side of said bolster member, each of said first and second leg portions including a plurality of spaced vertical slots therein, said frame means including a plurality of divider members depending from said elongated bolster member and extending between said first and second leg portions intermediate said spaced vertical slots therein for coacting therewith to form a plurality of downwardly opening compartments, each of said divider members being in the shape of a plate, each of said compartments being in the shape of a box;

b. a plurality of axle means, each of said plurality of axle means extending through one of said slots in said first leg portion and one of said slots in said second leg portion; each of said plurality of axle means including an elongated cylindrical axle member for extending through one of said vertical slots in said first leg portion, each of said axle members including a pair of end portions for extending ourwardly of said first and second leg portion; each of said plurality of axle means including a saddle member for being positioned in one of said compartments of said frame means, said saddle member having a body portion and having a first leg portion depending from a first side of said body portion and a second leg portion depending from a second side of said body portion, each of said first and second leg portions including a circular aperture therethrough for allowing said axle member to extend therethrough, said body portion being in the shape of a plate; each of said plurality of axle means including a stop member for preventing complete rotation of said axle member, said stop member including a block portion fixedly attached to said axle member for coacting with said body portion of said saddle member to prevent full rotation of said axle member within said saddle member while allowing partial rotation thereof;

c. a plurality of wheel means, one of said plurality of wheel means being rotatably mounted on each end of each of said plurality of axle means; and

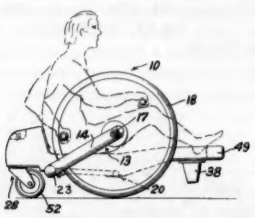
d. a plurality of resilient pad members, each of said resilient pad members being positioned in one of said compartments of said frame means between each of said plurality of axle means and said frame means for allowing each of said axle means a degree of movement relative to said frame means.

4,066,273

TOY CAR

Raymond J. Lohr, 5043 Sterrettania, Erie, Pa. 16506

Filed June 9, 1976, Ser. No. 694,249
Int. Cl.[2] B62M *1/14*
U.S. Cl. 280—211 **15 Claims**



15. A toy vehicle comprising,

a body having a seat and a backrest thereon,

a generally U-shaped frame having two upwardly and forwardly extending legs and an intermediate member,

inwardly-extending axles attached to said legs at the ends thereof, remote from said intermediate member,

a wheel on each said axle,

a U-shaped wire having two spaced legs and an intermediate member received in a groove in said body,

a slot in said body receiving said intermediate member of said U-shaped frame,

tne legs of said U-shaped wire extending through holes in said U-shaped frame and clips fixed to said body overlying said intermediate member of said frame and said intermediate part of said wire, holding said wire and said intermediate member of said frame in said groove and said slot respectively,

a caster wheel on said body rearward of said intermediate member,

a footrest on said body on the end thereof spaced from said caster wheel, and

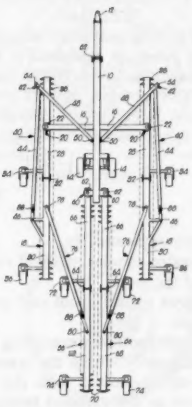
a bumper on said body adjacent said footrest for engaging the ground.

4,066,274

TANDEM FOLDING IMPLEMENT

Raymond A. Adee, Newton, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed July 29, 1976, Ser. No. 709,880
Int. Cl.[2] A01B *73/00, 5/06*
U.S. Cl. 280—411 A **15 Claims**



1. A tandem folding implement comprising:

a central, fore-and-aft extending tongue;

a first pair of tool-supporting beams projecting laterally from opposite sides of the tongue;

a second pair of tool-supporting beams behind said first pair and projectng laterally from opposite sides of the tongue.

said tongue and said beams being supported for over-the-ground travel in the direction of the longitudinal axis of the tongue;

means mounting said beams for horizontal swinging movement between laterally widespread working positions and laterally compact, transport positions,

each of said beams having its own upright axis about which said swinging movement of the beam occurs with each said upright axis being spaced apart horizontally from each other said upright axis; and

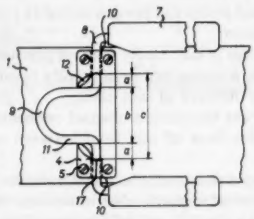
control means coupled with said beams for maintaining the latter in preselected angular relationships with respect to one another and said tongue in said working and transport positions, respectively,

said control means being coupled with said beams in such a manner that the two beams on each side of the tongue are constrained to move in the same direction during said swinging movement thereof about their axes.

4,066,275
SKI BRAKE

Hans Martin, Chasernweg 7, Kloten, Switzerland

Filed Feb. 19, 1976, Ser. No. 659,255
Claims priority, application Switzerland, Feb. 21, 1975, 2191/75; Mar. 24, 1975, 3735/75; Apr. 24, 1975, 5250/75
Int. Cl.[2] A63C 7/10
U.S. Cl. 280—605 14 Claims



1. A ski brake for a ski of the type having a top surface and a longitudinal central axis, a bottom contact surface and a ski boot binding on the top surface, the brake comprising the combination of

a brake arm;

a pivot pin fixedly attached to said brake arm and extending transversely relative to said ski;

bracket means mounted on the top surface of the ski for rotatably supporting said pivot pin,

said pin being rotatable between a first position in which said brake arm is substantially parallel with and above the bottom contact surface of said ski and a second braking position in which said brake arm extends downwardly beyond said bottom surface;

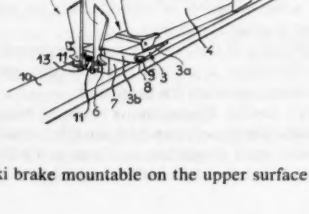
resilient laterally deformable spring means connected to said pivot pin laterally relative to the central longitudinal axis of the ski, said spring means having a lever arm portion contactable by a ski boot in the binding, said lever arm portion being adjacent the top surface of the ski when said pivot pin is in said first position and which extends upwardly from said top surface when said pin is in said braking position; and

means on said bracket means defining a cam surface having a slope relative to the axis of rotation of said pin for contacting said spring means to laterally deform said spring means when said pin and said brake arm are rotated toward said first position when a ski boot depresses said lever arm and to permit the lateral urging of said spring means to rotate said pin and arm toward said braking position when said lever arm is released.

4,066,276
SKI BRAKE

Georges Pierre Joseph Salomon, Annecy, France, assignor to S.A. Etablissements Francois Salomon et Fils, Annecy, France

Filed Mar. 22, 1976, Ser. No. 669,460
Claims priority, application France, Mar. 25, 1975, 75.09280
Int. Cl.[2] A63C 7/10
U.S. Cl. 280—605 10 Claims

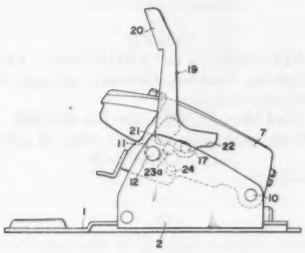


1. A ski brake mountable on the upper surface of a ski and comprising at least one arresting arm forming a blade, means pivotably mounting the arm on the upper surface of the ski for movement between an inactive position above the ski, and an active position in which said blade projects under the ski, actuator means including an elastic means for causing the blade to travel from its inactive position to its active position, a step-on-pedal, for engagement by a boot, means pivotably supporting the step-on pedal on the upper surface of the ski in a position projecting above the upper surface of the ski and means connecting the step-on pedal with the blade to displace the blade to inactive position when the boot is applied on the ski, said elastic means comprising first and second spring means, and means for transmitting the force of said first and second spring means to said blade, said first spring means including an auxiliary spring of low tension, said force transmitting means transmitting the force of the auxiliary spring on the blade until said blade attains a critical intermediate position between said active and inactive positions, said second spring means including a main spring of high tension, said force transmitting means transmitting the force of the main spring to said blade at a position in which the main spring will not produce rotation of the blade until said blade reaches said critical intermediate position whereafter the force of said main spring is transmitted to the blade at a position to produce rotation of said blade, said force transmitting means transmitting the force of the main spring conjointly with the first spring means at least during a portion of the remainder of the travel from the critical intermediate position to the active position.

4,066,277
SKI BOOT HEEL BINDING HAVING IMPROVED UNLOCKING DEVICE

Masahiro Murata, Matsudo, Japan, assignor to Hope Co., Ltd., Tokyo, Japan

Filed Sept. 30, 1976, Ser. No. 728,164
Claims priority, application Japan, July 19, 1976, 51-85059
Int. Cl.[2] A63C 9/08
U.S. Cl. 280—626 7 Claims



1. A ski boot heel binding comprising a base plate having front and rear end portions thereon and adapted to be mounted on a ski, supporting means mounted on said base plate, a pivotally mounted body member having a heel holding jaw at the front end thereof and pivotably connected to said supporting means, a retractable locking means for normally setting said body member to a heel holding position, said body member being displaced to a heel releasing position when said locking means is retracted, and an unlocking device for retracting said locking means, and unlocking device including an unlocking lever the front end portion of which is operatively connected to said locking means and the rear end of which projects outwardly beyond the rear end portion of said body member, and a pair of upper and lower fulcrum means provided rearwardly of the front end of said unlocking lever and arranged in such a manner that when the rear end of said lever is depressed downwardly, the lower front end portion of said lever engages with said lower fulcrum means to retract said locking means by operation of the leverage thereon, and when the same rear end

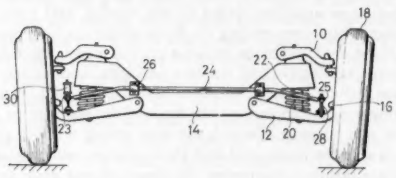
of said lever is moved upwardly, the upper front end portion of said lever engages with said upper fulcrum means to retract said locking means by operation of the leverage thereon.

4,066,278

STABILIZER ASSEMBLY FOR USE IN VEHICLES

Tatsuya Takagi, 6-10 Araebisumachi, Nishinomiya, Hyogo, Japan

Filed Jan. 16, 1976, Ser. No. 649,611
Claims priority, application Japan, Aug. 23, 1975, 50-102429
Int. Cl.[2] B60G *11/64*
U.S. Cl. 280—710 **9 Claims**



1. A stabilizer assembly comprising, in combination, a torsion bar having a central portion and end portions, said central portion being twistably mounted on the frame of a vehicle, and a slidable braking device disposed at least at one end of said torsion bar, said slidable braking device having a slidable cylinder member and a fixed piston member secured, respectively, to the end portion of the torsion bar and the moving portion of the swing arm of the suspension system of the vehicle, said cylinder member and piston members being reciprocal relative to each other under a certain braking force with the stroke thereof being limited to a length smaller than the maximum twistable amplitude of the ends of said torsion bar, the end portions of said torsion bar having such inertias to induce the sliding action of said slidable braking device.

4,066,279

PNEUMATIC SPRING OF ADJUSTABLE LENGTH

Panoyotis Kaptanis, Neuwied, Germany, assignor to Stabilus GmbH, Koblenz, Germany

Filed Mar. 23, 1976, Ser. No. 669,640
Claims priority, application Germany, Mar. 26, 1975, 2513302
Int. Cl.[2] F16F *5/00*
U.S. Cl. 280—711 **10 Claims**

1. A pneumatic spring comprising:

a. a cylinder having an axis and bounding a sealed cavity therein;

b. a piston assembly including

1. a piston portion movable in said cavity between two axially terminal positions and separating two compartments of said cavity, and

2. an axially elongated piston rod portion having one axially terminal part fastened to said piston portion in said cavity and another axially terminal part outside said cavity, said piston rod portion movably passing through said cylinder;

c. a body of fluid in said cavity under a pressure higher than atmospheric pressure and permanently biasing said piston rod portion outward of said cavity;

d. conduit means bounding a channel connecting said compartments for flow of said fluid between said compartments; and

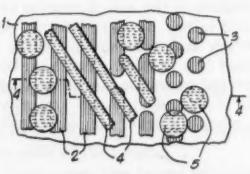
e. cooperating valve means on said cylinder and on said piston assembly responsive to movement of said piston portion into a position spacedly intermediate said terminal positions for closing said channel and for thereby sealing said compartments from each other, and responsive to movement of said piston portion from said intermediate position toward either terminal position thereof for opening said channel.

4,066,280

DOCUMENTS OF VALUE PRINTED TO PREVENT COUNTERFEITING

Anthony LaCapria, Brooklyn, N.Y., assignor to American Bank Note Company, New York, N.Y.

Filed June 8, 1976, Ser. No. 693,921
Int. Cl.[2] B42D *15/00*
U.S. Cl. 283—8 R **7 Claims**



1. A document of value incapable of reproduction in true color by a color-analyzing-and-synthesizing copier, comprising:

a. a printable substrate having two overlapping but non-registering imprints thereon;

b. one of said imprints being in a color reproducible by said copier; and

c. the other of said imprints being in an ink including a specularly reflective opaque coloring material, said other imprint being incapable of reproduction by said copier, said other imprint comprising:

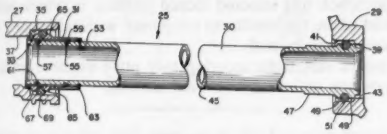
1. a multiplicity of fine, closely spaced elements having a small dimension in at least one direction and thereby difficult to reproduce by hand; and

2. an area having dimensions in each of two mutually perpendicular directions which are substantially greater than said small dimension, said area being free of any overprint and thereby readily observable.

4,066,281
PORSCHE AUTOMOBILE OIL DRAIN REPLACEMENT TUBE

John C. De Bonis, 9591 Rocky Mountain Drive, Huntington Beach, Calif. 92646

Filed July 16, 1976, Ser. No. 705,978
Int. Cl.[2] F16L *21/00*
U.S. Cl. 285—31 6 Claims



1. A replacement oil drain tube for use in interconnecting the aperture on the cylinder head of a Porsche automobile engine with the aperture on the crankcase thereof, each of said apertures including a larger diameter external tubular section separated by a shoulder from a smaller diameter internal tubular section, said apertures being axially aligned but being subject to substantial misalignment during temperature fluctuations of said engine, comprising:

a main tube having sufficient length to span the distance between said larger diameter sections, a large end located within said larger diameter section of one of said apertures, and a small end centered within said larger diameter section of the other of said apertures;

a telescoping sleeve surrounding a portion of the length of said main tube adjacent said small end thereof, said telescoping sleeve located within said larger diameter section of the other of said apertures;

a sealing member positioned on said small end of said main tube, said member sealingly engaging said main tube and said telescoping sleeve;

means for locking said telescoping sleeve in place on said main tube to prohibit inward axial movement of said small end of said main tube relative said telescoping sleeve;

said large end and said telescoping sleeve having larger outside diameters than the inside diameter of said smaller diameter internal tubular sections, but smaller outside diameters than said larger diameter internal tubular sections to permit cocking of said large end of said sleeve within said larger diameter internal tubular sections; and

a pair of resilient O-rings, one positioned between said larger end and said larger diameter section of said one of said apertures, the other positioned between said telescoping sleeve and said larger diameter section of said other of said apertures, said locking means, abuttment of the end of said tube and said telescoping sleeve with said smaller diameter internal tubular sections and frictional engagement of said O-rings forming the sole means of attaching said replacement drain tube to said engine, said O-rings and said sealing member sealing said tube to said cylinder head and said crankcase during said substantial misalignment.

4,066,282
POSITIVE TUBING RELEASE COUPLING

Roy R. Vann, Box 38, Artesia, N. Mex. 88210

Continuation-in-part of Ser. No. 517,391, Oct. 23, 1974, Pat. No. 3,966,236. This application June 1, 1976, Ser. No. 691,384
Int. Cl.[2] F16L *37/08*
U.S. Cl. 285—39 12 Claims

1. A wireline actuated, releasable coupling apparatus which can be interposed within a tool string for subsequently parting one marginal length of the string from the other, comprising:

a female member having an end for attachment into an upper marginal length of a tool string;

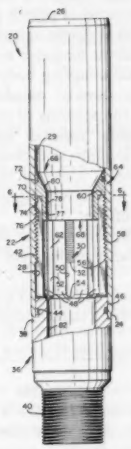
a male member having an end for attachment into a lower marginal length of a tool string;

a marginal lower end of said female member and a marginal upper end of said male member being of a diameter which permits them to be telescopingly joined together, one within the other;

a releasing member; said releasing member having a marginal upper end of a relative large O.D. for slidably engaging the interior wall surface of said female member, and a marginal lower end of a relative small O.D. for slidably engaging the interior surface of said male member, there being a shoulder formed between said large O.D. and small O.D. upper and lower ends;

said female member, said male member, and said releasing member being concentrically arranged respective to one another, means forming an axial passageway through said female member, said male member, and said releasing member; said large O.D. end and small O.D. end, respectfully, of said releasing member being slidably received within at least a portion of said marginal lower end and marginal upper end, respectively, of said female and male members, respectively;

a plurality of radially arranged fingers jointly formed by said



marginal upper end of said male member, said small O.D. marginal end of said releasing member being interposed between said fingers and said axial passageway to urge said fingers against said marginal lower end of said female member;

said releasing member having an upper conical entrance spaced from a lowermost circumferentially extending end portion, said shoulder of said releasing member abuttingly engages the upper terminal end of said male member, said lowermost circumferentially extending end of said releasing member forms a shoulder which a fishing tool can engage;

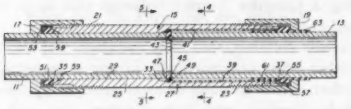
a marginal exterior wall of said fingers and a marginal interior wall of said female member having coacting threads formed thereon which mutually engage one another; whereby,

said releasing member can be moved axially to allow said fingers to resistingly move towards one another, whereupon said male and female members slide apart from one another, thereby releasing said male and female members from one another.

4,066,283
HIGH PRESSURE INSULATED COUPLING

Leslie G. Struck, Arlington Heights, Ill., assignor to Chicago Fittings Corporation, Broadview, Ill.

Filed Feb. 6, 1976, Ser. No. 655,896
Int. Cl.[2] F16L *11/12*
U.S. Cl. 285—53 **9 Claims**



1. An insulated coupling for mechanically joining two sections of pipe, while electrically isolating the sections of pipe, comprising:

a generally cylindrical coupling body into which and end of each of the sections of pipe to be joined may be inserted;

a first length of said coupling body extending from a first end of said coupling body through which a first one of the sections of pipe is inserted;

a second length of said coupling body extending from a second end of said coupling body through which the second of the sections of pipe is inserted;

a generally cylindrical sleeve of insulating material having a substantially uniform diameter extending within said second length of said coupling body;

an insulating, frusto-conical, annular stop member to separate the ends of the sections of pipe, the smaller diameter end of said annular member sliding easily within said sleeve for insertion into said coupling body and positioning along said sleeve, while the larger diameter end of said annular member fits tightly against said sleeve to oppose withdrawal therefrom;

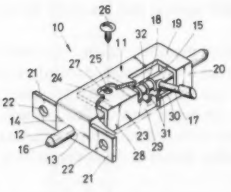
limiting means at the inner end of said sleeve to prevent said stop member from entering said first length of said coupling body; and

gasket means at each end of said coupling body to connect said coupling body to the sections of pipe with a fluid tight seal.

4,066,284
LATCH FOR WINDOWS OR DOORS

Akio Ikemura, Kurobe, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1975, Ser. No. 624,891
Claims priority, application Japan, Oct. 22, 1974, 49-128270[U]
Int. Cl.[2] E05C *5/02*
U.S. Cl. 292—62 **6 Claims**



1. A latch for a closure member that is movable with respect to a frame member, said latch comprising:

a. a housing having mounting means by which it can be fixedly mounted on one of said members, said housing having a lateral opening, and said housing having an end wall with a hole disposed to face the other one of said members;

b. a latch bolt slidably supported in said housing and having one end extending through said hole for cooperation with said other one of said members;

c. a handle secured to said latch bolt and extending through said lateral opening with clearance to enable said latch bolt to be moved both along its axis and about its axis;

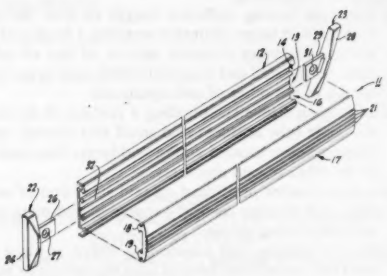
d. a plate member disposed within said housing and slidable in the direction of said latch bolt axis, there being engaging means on said plate member in registration with said lateral opening for engaging with said handle to hold said latch bolt in a selected locked position in which said one end of the latch bolt can cooperate with said other one of said members; and

e. means selectably securing said plate member in a fixed position with respect to said housing.

4,066,285
ORNAMENTAL PROTECTIVE TRIM STRIP FOR MOTOR VEHICLES

Daniel L. Hall, Citrus Heights, and Neal Duane Dunivan, Roseville, both of Calif., assignors to Trim-Line, Inc., North Highlands, Calif.

Filed Dec. 9, 1976, Ser. No. 748,909
Int. Cl.[2] B60R *19/00;* E04F *19/02*
U.S. Cl. 293—62 **6 Claims**



1. A protective trim strip comprising:

a. an elongated channel extending between a first end and a second end, said channel being formed with a central longitudinal generally T-shaped in cross-section groove and first and second longitudinal outer generally T-shaped in cross-section grooves transversely spaced on opposite sides of said central groove, said grooves extending between said ends of said channel;

b. an elongated resilient bumper extending axially coextensively with said channel and being formed with first and second generally T-shaped in cross-section projections interlocking with the walls of said first and second outer grooves of said channel, respectively, for securing said resilient bumper to said channel, said bumper extending over said central groove; and,

c. first and second end caps formed with tangs providing an interference fit with the walls of said central groove of said channel to secure said first and second end caps to said first and said second ends of said channel, respectively.

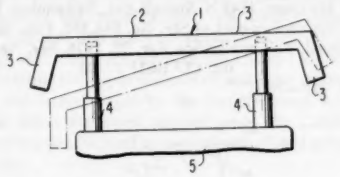
4,066,286
BUMPER FOR MOTOR VEHICLES

Fritz Haberle; Daniel Riechers, both of Sindelfingen, and Alfred Hochrathner, Boblingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Oct. 10, 1975, Ser. No. 621,580
Claims priority, application Germany, Oct. 16, 1974, 2449240
Int. Cl.[2] B60R *19/08*
U.S. Cl. 293—87 **17 Claims**

1. A bumper for motor vehicles, which comprises a U-shaped profile means having a web and legs, the web forming the front side of the bumper and constituting a support for

guide members operable to guide fastening means that are secured at a relatively fixed part of the vehicle, characterized in that the guide members are angularly bent spring steel bracket means serving as damping means which include leg portions and web portions, the leg portions being secured at



the bumper and the web portions at the fastening means and wherein two U-shaped spring steel bracket means each are provided which abut at one another with the outer sides of their web portions outside of the area of the fastening means and which surround the fastening means within the area of the latter.

4,066,287

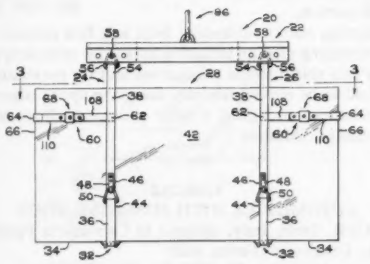
SLING ASSEMBLY FOR LIFTING SHEET MATERIAL

James R. Rowley, Freeport, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 7, 1976, Ser. No. 703,167

Int. Cl.[2] B66C *1/16*

U.S. Cl. 294—74 **16 Claims**



1. In a sling assembly for lifting at least one sheet wherein the sling assembly is of the type having a pair of slings secured in spaced relationship on lifting means, the improvement comprising:

each of the slings comprising:

a first strap section having a first end and a second end, the first end secured to the lifting means;

a second strap section having a first end and a second end, the first end secured to the lifting means;

means for securing the second end of each of said strap sections together;

and

a half bridle having a first end and a rigid second end, the first end secured to the first strap section and the second end of said half bridle engageable with adjacent end of the at least one sheet terminating short of the second strap section.

4,066,288

LOAD ADJUSTABLE RELEASE DEVICE

Joseph Medrano, Jr., 8 Ipswich Court, Florissant, Mo. 63033

Filed June 22, 1976, Ser. No. 698,661

Int. Cl.[2] B66C *1/28*

U.S. Cl. 294—83 R **6 Claims**

1. A line coupler means which automatically decouples when a selected line tension is exceeded comprising:

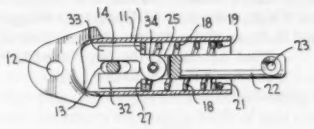
a tubular housing means having a first line attachment means at a first end thereof and open ended at the second end thereof and having a selected longitudinal axis;

a compression means disposed within said housing means, said compression means having an elongated hollow center configuration and disposed with said hollow center substantially in alignment with said axis of said housing such that said compression means is adapted for compression along said axis of said housing;

tubular plunger means disposed within said hollow center of said compression means and adapted for axial movement therein, said tubular plunger means having a second line attachment means at a first end thereof, said first end of said plunger means disposed in the vicinity of said second end of said housing means such that a tension force may be applied across said first end of said housing means and said first end of said plunger means of said line coupler means;

restraining means attached to said housing means substantially at said second end thereof and adapted to restrain said compression means within said housing means when a tension force is applied across said line coupler means;

at least one jaw hook means attached to the second end of said tubular plunger means within said housing, said jaw



hook means having an elongated shank portion with one end thereof attached to said plunger means and a transverse extension at the other end of said shank portion, said jaw hook means adapted for disposition in a first position and for disposition in a second position within said housing means, said transverse extension of said jaw hook means adapted to engage the end of said compression means opposite said restraining means in said jaw hook means first position, said transverse extension of said jaw hook means adapted to enable withdrawal of said plunger means and attached jaw hook means through said hollow of said compression means in said second position of said jaw hook means;

and compression release means adapted to maintain said jaw hook means in said first position until said compression means reaches a predetermined compression state representative of the tension force applied across said line coupler whereby release of said compression means actuates movement of said jaw hook means from said first position to said second position thereof and said tubular housing means and said tubular plunger means are pulled apart by the tension force applied and become separate elements of said line coupler means.

4,066,289

VEHICLE CARRIERS

Habib T. Gargour, c/o T. Gargour & Fils, Beirut, Lebanon

Filed Mar. 4, 1976, Ser. No. 663,772

Claims priority, application Lebanon, Mar. 6, 1975, 87; May 15, 1975, 161; May 17, 1975, 179; May 20, 1975, 180

Int. Cl.[2] B60P *1/00*

U.S. Cl. 296—1 A **8 Claims**

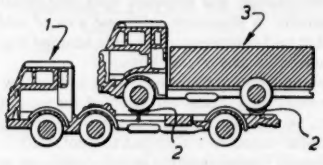
1. A multiple use chassis for transport vehicles, characterized by

a. a pair of spaced apart parallel longitudinal chassis members;

b. said chassis members having a load bearing length of at least 6 meters;

c. a plurality of substantially flat parallel spaced apart transverse support members extending between said chassis members;

d. said support members having a load bearing length of at least 2.5meters;
e. at least one said support member being displaceable along said chassis members;

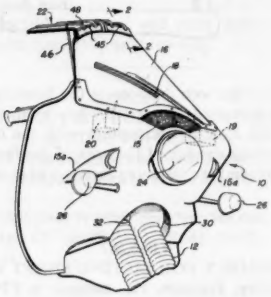


f. each said support member having a plurality of connecting apertures adjacent said chassis members; and
g. means extending through said apertures for connecting said support members to said chassis members.

4,066,290
BICYCLE FAIRING
Gerald A. Wiegert, Venice, and James R. Negele, Santa Monica, both of Calif., assignors to Gerald A. Wiegert, Venice and Richard S. Dyer, Palos Verdes Estates, both of, Calif.
Filed Apr. 30, 1976, Ser. No. 682,092
Int. Cl.[2] B62J *17/02*
U.S. Cl. 296—78.1 **5 Claims**

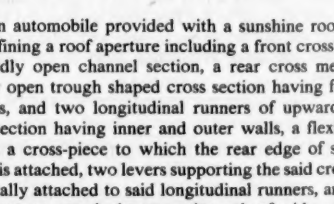
1. A bicycle fairing comprising:
a fairing shell shaped and sized to partially shield the front upper region of a bicycle and rider, including the handle bars and rider's hands, said fairing shell presenting a rounded streamlined surface toward the front of the bicycle and a concave enclosure toward the rear, said fairing shell including a lower portion having an integral front-wheel fender to provide improved streamlining and to maximize the size of said enclosure, said lower portion further having a pair of streamlined extensions partially surrounding the front-wheel fork of the bicycle, said fairing shell further including an upper portion having a trailing upper edge of arcuate configuration to facilitate positioning to the rider's head behind said fairing shell, said upper and lower portions further having trailing side edges which merge in an arcuate configuration to facilitate positioning of the rider's hands behind said fairing shell;
a pair of generally upright, parallel, horizontally spaced apart mounting rods attached at their upper ends to said upper portion of said fairing shell and attached at their lower ends to said lower portion of said fairing shell;
interconnection means operative to connect said rods to the handles of the handle bars, each interconnection means including adjustably extensible sections for adjusting the distance between said fairing shell and the front of the handles, each interconnection means further being vertically adjustably movable on said rods for adjusting the vertical location of said fairing shell relative to the handles; and
clamping means for clamping said streamlined extensions of said lower portion to the front-wheel fork.

4,066,291
WEATHERIZED SYSTEM FOR MOTORCYCLE
John S. Hickman, 4149 N. Stowell Ave., Milwaukee, Wis. 53211
Continuation-in-part of Ser. No. 548,357, Feb. 10, 1975, abandoned. This application Apr. 22, 1976, Ser. No. 679,184
Int. Cl.[2] B62J *17/00*
U.S. Cl. 296—78.1 **26 Claims**



13. A removable shield for use with a windscreen having an upper edge to protect a rider from the weather such as rain or sun; said shield including:
a first portion;
a mounting portion extending from said first portion;
said mounting portion including means for releasably securing said shield to the windscreen and for permitting said shield to be moved laterally along the upper edge of the windscreen to afford a rider protection from adverse weather conditions.

4,066,292
AUTOMOBILE WITH SUNSHINE ROOF
Renzo Carli, Turin, Italy, assignor to Carrozzeria Pininfarina S.p.A., Grugliasco (Turin), Italy
Filed Jan. 10, 1977, Ser. No. 758,273
Int. Cl.[2] B60J *7/00*
U.S. Cl. 296—137 C **8 Claims**



1. In an automobile provided with a sunshine roof having means defining a roof aperture including a front cross member of upwardly open channel section, a rear cross member of upwardly open trough shaped cross section having front and rear walls, and two longitudinal runners of upwardly open channel section having inner and outer walls, a flexible roof covering, a cross-piece to which the rear edge of said roof covering is attached, two levers supporting the said cross-piece and pivotally attached to said longitudinal runners, and a pair of flexible straps attached to opposite ends of said cross-piece, the leading ends of said straps being adapted to engage in the channel of the front cross member to tension the straps, which cover the longitudinal edges of the roof covering when the latter is fitted over said roof aperture,

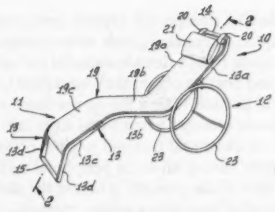
the improvement which comprises a removable roof panel for use as an alternative to the flexible roof covering, comprising a sheet of transparent rigid plastics material, provided with hook means at its front edge which engages in the channel section front cross member and further provided with a lip on its rear edge which fits over the front wall of the trough shaped rear cross member, the lateral edges of said sheet cooperating along their lower surfaces with the inner walls of the channel section side runners while the upper surfaces of said sheet are covered along said lateral edges by the flexible straps normally used to cover and exert pressure upon the longitudinal edges of the flexible roof covering in the closed position of the latter.

4,066,293

ADJUSTABLE CARRIER APPARATUS TO DEFINE FURNITURE OR THE LIKE

Heinz Meier, Pacific Palisades, Calif., assignor to Landes Manufacturing Company, Los Angeles, Calif.

Filed June 9, 1976, Ser. No. 694,179
Int. Cl.[2] A47C 3/00
U.S. Cl. 297—325 **1 Claim**



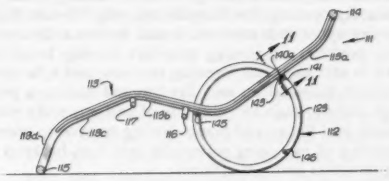
1. In adjustable carrier apparatus
a. a carrier frame, and
b. a rotary support including two integrally interconnected upright wheels supporting the frame in a first frame position relative to the support, the frame having a second and alternate position relative to the rotary support, in which the rotary support supports the frame,
c. the frame including a stabilizing portion having a seat and a ground engaging portion projecting in forwardly spaced relation from the rotary support in each of said positions, and
d. the frame having a backrest portion which is substantially entirely supported on the rotary support in each of said first and second positions, the support of the frame by the rotary support blocking rotation of the support in each of the two frame positions,
e. the rotary support including multiple members connected only to peripheral portions of the wheels and extending laterally therebetween, the wheels being centrally open, said members angularly and sequentially spaced about a common axis of rotation defined by said wheels,
f. said backrest portion directly overlying and supported by two of said members in each of said frame positions,
g. said frame including hooks to engage said members, said hooks including primary laterally spaced hooks and secondary laterally spaced hooks, said primary hooks longitudinally spaced along the frame from said secondary hooks.

4,066,294

ADJUSTABLE CARRIER APPARATUS TO DEFINE FURNITURE OR THE LIKE

Heinz Meier, Palisades, Calif., assignor to Landes Manufacturing Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 694,179, June 9, 1976. This application Nov. 10, 1976, Ser. No. 740,395
Int. Cl.[2] A47C 3/00
U.S. Cl. 297—325 **2 Claims**



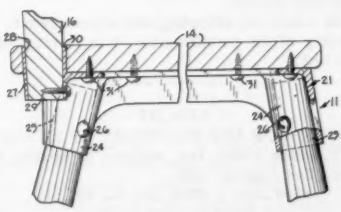
1. In adjustable carrier apparatus
a. a carrier frame, and
b. a rotary support including two integrally interconnected upright wheels supporting the frame in a first frame position relative to the support, the frame having a second and alternate position relative to the rotary support, in which the rotary support supports the frame
c. the frame including a stabilizing portion having a seat and a ground engaging portion projecting in forwardly spaced relation from the rotary support in each of said positions, and
d. the frame having a backrest portion which is substantially entirely supported on the rotary support in each of said first and second positions, the support of the frame by the rotary support blocking rotation of the support in each of the two frame positions,
e. the rotary support including multiple tie members connected only to peripheral portions of the wheels and extending laterally therebetween, the wheels being centrally open, said members angularly and sequentially spaced about a common axis of rotation defined by said wheels,
f. the frame and said rotary support having hinged interconnection, adjacent the backrest, by means of shaft elements and bearing elements one of which is on the peripheral portions of the wheels and the other of which is on the frame,
g. said backrest portion directly overlying and supported by said hinged interconnection and said one of said tie members in each of said frame positions,
h. the frame and said rotary support having hinged interconnection, adjacent the backrest.

4,066,295

CHAIR AND BASE FRAME THEREFOR

Harvey M. Severson, 8418 Dupont Ave. South, Minneapolis, Minn. 55420

Filed Nov. 29, 1976, Ser. No. 745,952
Int. Cl.[2] A47C 7/00
U.S. Cl. 297—443 **2 Claims**



1. A chair comprising a generally rectangular rigid one-piece frame member including a horizontal flange having a flat

top defining an enlarged central opening, and a peripheral skirt depending from said flange to provide front and rear portions and laterally spaced opposite side portions, said frame member further including a plurality of downwardly extending bosses at the opposite ends of said front, rear and side portions and defining downwardly opening upwardly tapering recesses, and a pair of other bosses extending upwardly from the top surface of said rear frame portion each inwardly spaced from a different one of said downwardly extending bosses at the opposite ends of said rear portion, said upwardly extending bosses having upwardly opening downwardly tapering recesses therein; legs having upper ends received in said downwardly opening recesses; backrest supporting members having lower ends received in said upwardly opening recesses; and a horizontal seat element mounted on said flat top and having a pair of openings therethrough for reception of said upwardly extending bosses; said flange and bosses having transverse openings for reception of anchoring screws for said legs, backrest supporting members and seat element.

4,066,296

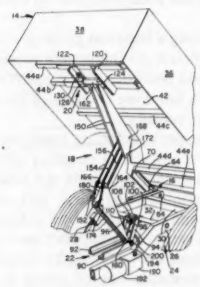
TRUCK BED TILTING MECHANISM

Louis M. Ray, Jr., 6305 Pine St., Rowlett, Tex. 75088; Leo L. Pease, 511 E. Main St., Richardson, Tex. 75081, and Henry C. Brown, 410 Crusader Drive, Dallas, Tex. 75217

Filed Dec. 28, 1976, Ser. No. 755,022

Int. Cl.[2] B60P *1/20*

U.S. Cl. 298—22 J **16 Claims**



7. A truck bed tilting apparatus for use between the hauling bed and frame of a truck having the bed pivotally connected adjacent the rear of the frame to permit relative rotation between the hauling bed and the frame, said apparatus comprising:

four rigid bars jointed in a parallelogram form having a first and second pair of parallel arms, said first pair of parallel arms having an extension beyond the parallelogram with the end of one of said extensions being pivotally connected to the hauling bed and the end of the extension of the second arm of said pair to be pivotally connected to the truck frame,

a variable length actuator arm interconnected between the extension bearing pair of parallel arms, said actuator arm being connected to the arms of said first pair intermediate of the ends thereof,

means for selectively extending said actuator arm to vary the geometry of the parallelogram form thereby tilting the truck bed.

4,066,297

PROCESS FOR THE RECOVERY OF URANIUM

Andrew P. Spence, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed June 1, 1976, Ser. No. 691,344

Int. Cl.[2] E21B *43/28*

U.S. Cl. 299—4 **7 Claims**

1. An improved process for the solution mining of uranium from a subterranean formation containing same in which an injection and production well are drilled and completed within said formation, alkaline leach solution and an oxidant are injected through said injection well into said formation to dissolve said uranium, and said dissolved uranium is recovered via said production well, wherein the improvement comprises introducing an alkaline leach solution undersaturated in carbonates into said formation.

4,066,298

HYDRAULICALLY TRANSPORTED CAPSULE

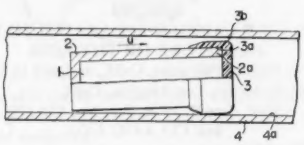
Masakatsu Sakamoto, Matsudo; Syosaku Watanabe, Ushikumachi; Takafumi Karino, Tomobemachi; Junichi Yazu, Shimoinayoshi; Kouichi Takashima, Ibaraki; Hiroshi Miyashiro, Tokyo; Takeo Takagi, Shimoinsayoshi, and Takao Konno, Shimoinayoshi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 13, 1976, Ser. No. 714,181

Claims priority, application Japan, Oct. 24, 1975, 50-144134[U]

Int. Cl.[2] B65G *51/06*

U.S. Cl. 302—2 R **4 Claims**



1. A hydraulically transported capsule comprising a cylindrical shell adapted to contain goods to be transported, and a cover member made from a flexible material and adapted to be fitted over one end portion of said shell, said shell being formed at its leading end portion with a fitting portion for said cover member, said cover member being fitted over said fitting portion of the shell to close said one end portion of the shell, and said cover member having an outer peripheral surface serving as a sliding surface of the capsule, wherein the sliding surface of said cover member has sliding means comprising a plurality of supporters arranged at least in a row circumferentially of the cover member, said supporters comprising elongated resilient members embedded in said sliding surface and extending radially outwardly of said sliding surface.

4,066,299

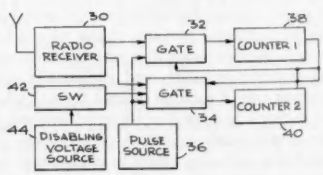
APPARATUS FOR LOCATING A MALFUNCTIONING BRAKE CONTROL VALVE ON TRAIN

Roy Milton Clements, Danville, Calif., assignor to Southern Pacific Transportation Company, San Francisco, Calif.

Continuation of Ser. No. 638,682, Dec. 8, 1975, abandoned. This application May 17, 1977, Ser. No. 797,764

Int. Cl.[2] B60T *17/22*

U.S. Cl. 303—20 **9 Claims**



1. In a railroad train which has an air brake pipe extending the length of the train, and wherein each car is equipped with

a brake control valve for venting said brake pipe when required for an emergency operation,

means for locating a malfunctioning brake control valve which has vented said brake pipe, comprising:

a first and a second transducer means respectively at the head end of said train and at the rear end of said train coupled to said brake pipe for respectively transmitting a first radio frequency signal and a second radio frequency signal in response to being actuated by a change in air pressure in said brake pipe caused by a malfunctioning brake control valve, and

receiving means at a single location on said train for receiving said first and second signals,

counter means at said single location to which said received first and second signals are applied to produce an indication of the difference, ($t1-t2$), in their times of receival caused by the difference in time required for the air pressure change caused by a malfunctioning brake control valve to move from said malfunctioning brake control valve through said brake pipe to said first transducer means and to said second transducer means, whereby the distance, X, of said operated valve means from one end of said train may be determined from the formula $X=L/2-465\ (t1-t2)$, where L is the length of the train.

4,066,300

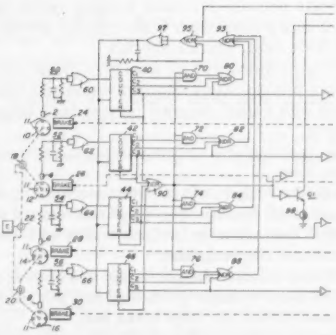
DIGITAL TRACTION CONTROL SYSTEM

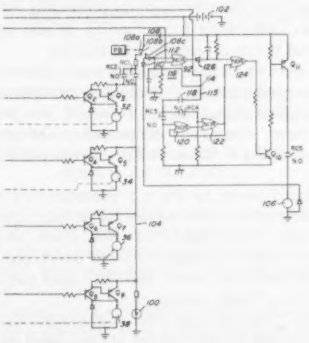
Thomas A. Devlin, Royal Oak, Mich., assignor to Aspro, Inc., Westport, Conn.

Filed Oct. 29, 1976, Ser. No. 737,058

Int. Cl.[2] B60T *8/10*

U.S. Cl. 303—96 **9 Claims**





1. A digital anti-spin brake control system for a motor vehicle having at least two driven wheels connected by a differential mechanism, comprising

a. a plurality of pulse generating means (**11**; **2**, **4**, **6**, **8**) for generating pulses in accordance with the rotational velocity of each of the driven wheels, respectively;

b. a plurality of normally de-energized solenoid-operated brake means (**24**, **26**, **28** and **30**) associated with said driven wheels, respectively;

c. a plurality of counters (**40**, **42**, **44** and **46**) for counting the pulses generated by the pulse generating means associated with each wheel, respectively, each of said counters including at least three output terminals (**C1**, **C2**, **C3**);

d. means (**97**) for resetting all of the counters when said counters contain count totals which fall within a predetermined ratio, said counter reset means including

1. a plurality of two-input AND gates (**70**, **72**, **74**, **76**) associated with said counters, respectively, each of said AND gates having a first input connected with a first output terminal (**C1**) of the associated counter;

2. a plurality of first NOR gates (**80**, **82**, **84**, **86**) associated with said counters, respectively, each of said NOR gates having a first input connected with the output of the associated AND gate, and second and third inputs connected with the second and third output terminals of the associated counter, respectively;

3. a second NOR gate (**90**) having a plurality of inputs connected with the third output terminals of said counters, respectively, the output of said second NOR gate being connected with the other inputs of each of said AND gates; and

4. a third NOR gate (**93**) the input terminals of which are connected with the output terminals of said first NOR gates, respectively, the output terminal of said third NOR gate being connected with said counter reset means; and

e. means operable when the count total of at least one of the counters exceeds the total of another counter by a value greater than said predetermined ratio for operating the brake means associated with the wheel which corresponds with the said one counter.

4,066,301

MODULATOR ASSEMBLIES FOR VEHICLE HYDRAULIC BRAKING SYSTEMS

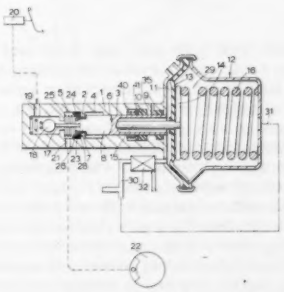
David Anthony Harries, Solihull, England, assignor to Girling Limited, Birmingham, England

Filed Apr. 5, 1976, Ser. No. 673,857

Claims priority, application United Kingdom, Apr. 25, 1975, 17211/75

Int. Cl.[2] B60T *8/04*

U.S. Cl. 303—115 **9 Claims**



1. A modulator assembly for a vehicle anti-skid braking system comprising a housing having an inlet port for connection to an hydraulic master cylinder, an outlet port for connection to the slave cylinder of a wheel brake, a chamber through which said inlet port communicates with said outlet port and having an effective volume which is variable and a bore communicating with said chamber, a control valve located be-

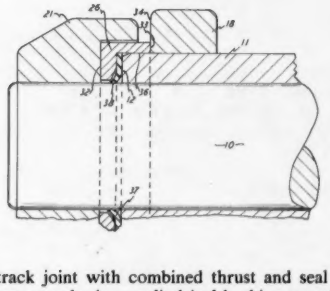
tween said inlet port and said outlet port, an imperforate expander piston working in said bore, said expander piston being movable between a first advanced position in which said effective volume is at a minimum and said control valve is open and a second retracted position in which said control valve is closed and said effective volume is larger, and modulator means responsive to a signal from means for sensing deceleration of a wheel braked by said brake for applying a bias force to said expander piston to determine the position thereof, said expander piston normally being disposed in said first position but movable into said second position by said modulator means when deceleration of said braked wheel exceeds a predetermined value, wherein said chamber comprises a first compartment, and a second compartment spaced axially from said first compartment and located at the end of said first compartment which is remote from said control valve, valve means directly operable by, and axially aligned, with said expander piston are provided for controlling communication between said first and second compartments, and said outlet port leads from said first compartment, said valve means being movable between a closed position when said expander piston is substantially in said advanced position and an open position when said expander piston is moved between said first and second position, a first area only of said expander piston which is smaller than a second total area thereof being exposed only to pressure in said first compartment when said valve means is in the said closed position, and said second total area of said expander piston being exposed to pressure in both said first and second compartments when said valve means is in said open position.

4,066,302

TRACK JOINT WITH COMBINED THRUST AND SEAL MEMBERS

John Merlin Baylor, Bettendorf, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Oct. 4, 1976, Ser. No. 729,582
Int. Cl.[2] F16J *15/34*
U.S. Cl. 305—11 **8 Claims**



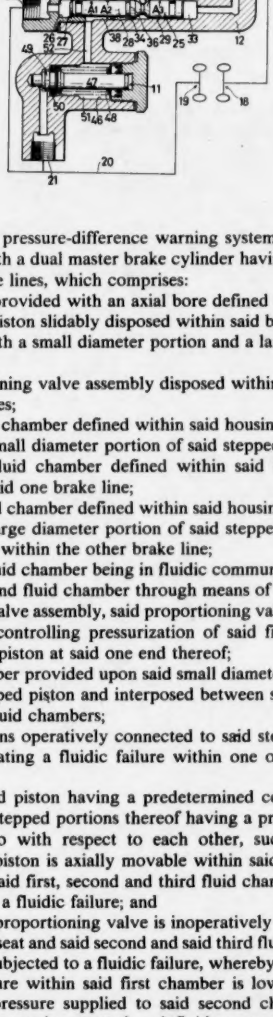
1. A track joint with combined thrust and seal members, comprising a track pin, a cylindrical bushing on said pin and having an annular end surface disposed on a plane transverse to the extent of and within the length of said pin, a first track link on said bushing, a second track link on said extending end of said pin and having a counterbore open toward said annular end surface and with a circular wall radially spaced from said pin and with an annularly-shaped bottom wall faced toward said annular end surface and with said bottom wall being of a total area larger than the total area of said annular end surface, a thrust ring disposed in said counterbore and between said annular end surface and said bottom wall and having an annular bearing surface disposed in contact with said bottom wall throughout the entire area of said annular bearing surface and with said entire area being larger than the entire area of said annular end surface, for dirt sealing between said annular bearing surface and said bottom wall and for presenting a larger axial thrust area compared to the axial thrust area presented by said annular end surface to said bottom wall, said track link on said bushing having an annular surface faced toward the end of said pin extending beyond said bushing, said thrust ring extending between and in contact with both said annular surfaces, and an elastic seal member disposed between said ring and said annular end surface for dirt sealing thereat.

4,066,303

BRAKE PRESSURE-DIFFERENCE WARNING SYSTEM FOR VEHICLES

Noriakira Ishigami, Chiryu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Continuation of Ser. No. 587,057, June 16, 1975, abandoned.
This application Aug. 13, 1976, Ser. No. 714,125
Claims priority, application Japan, June 14, 1974, 49-68438
Int. Cl.[2] B60T *8/26*
U.S. Cl. 303—6 C **5 Claims**



1. A brake pressure-difference warning system operatively associated with a dual master brake cylinder having two independent brake lines, which comprises:

a housing provided with an axial bore defined therein;

a stepped piston slidably disposed within said bore and provided with a small diameter portion and a large diameter portion;

a proportioning valve assembly disposed within one of said brake lines;

a first fluid chamber defined within said housing at one end of said small diameter portion of said stepped piston;

a second fluid chamber defined within said housing and within said one brake line;

a third fluid chamber defined within said housing at one end of said large diameter portion of said stepped piston and disposed within the other brake line;

said first fluid chamber being in fluidic communication with said second fluid chamber through means of said proportioning valve assembly, said proportioning valve assembly thereby controlling pressurization of said first chamber and said piston at said one end thereof;

a seal member provided upon said small diameter portion of said stepped piston and interposed between said first and second fluid chambers;

switch means operatively connected to said stepped piston for indicating a fluidic failure within one of said brake lines;

said stepped piston having a predetermined configuration, and the stepped portions thereof having a predetermined area ratio with respect to each other, such that said stepped piston is axially movable within said bore when each of said first, second and third fluid chambers is subjected to a fluidic failure; and

when said proportioning valve is inoperatively seated upon its valve seat and said second and said third fluid chambers are not subjected to a fluidic failure, whereby the hydraulic pressure within said first chamber is lower than the normal pressure supplied to said second chamber, said switch means is actuated and fluid communication between said first and said second fluid chambers is estab-

lished without passing through said proportioning valve assembly.

4,066,304

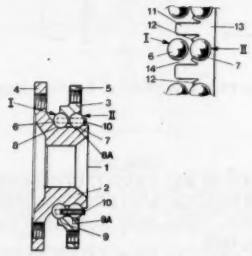
BEARING CAGE

Gordon Boyd Johnston, Beesd, Netherlands; Reinhart Michael Hillmann; Helmuth Martin Kregler, both of Schweinfurt, Germany; Bertil Sven Janson, and Hasse Eivind Strandberg, both of Gothenburg, Sweden, assignors to SKF Industrial Trading and Development Company B.V., Nieuwegein, Netherlands

Continuation of Ser. No. 506,617, Sept. 16, 1974, abandoned.
This application June 7, 1976, Ser. No. 693,602
Claims priority, application Netherlands, Sept. 9, 1973, 7312876

Int. Cl.[2] F16C *33/46*

U.S. Cl. 308—201 **22 Claims**



1. In a bearing including inner and outer rings, two axially spaced first and second annular rows of balls between said rings, and a cage insertable between said rings for separating the balls, the improvement in combination therewith wherein said cage has a generally annular shape about a central axis, and is flexible and comprises a plurality of circumferentially spaced partitions and a connecting member between and connecting each two adjacent partitions forming a generally U-shaped section, each of said sections having walls which define a U-shaped recess open at one end and closed at the other end, each recess having dimensions of breadth in the circumferential direction and depth in the axial direction, and each recess containing a pair of first and second generally axially aligned balls, each of said pairs comprising one ball from each of said first and second rows of balls, and at least one pair of resilient holding means projecting from walls of each recess for holding said first ball in one of said ends of said recess in fixed position relative to said walls, said second ball situated generally at the opposite end of each recess and able to move relative to said walls in both of said breadth and depth directions.

4,066,305

MODULAR ELECTRONIC DESK

Kenneth F. Gazarek, Warrenville, Ill., assignor to Equipto Electronics Corporation, Aurora, Ill.

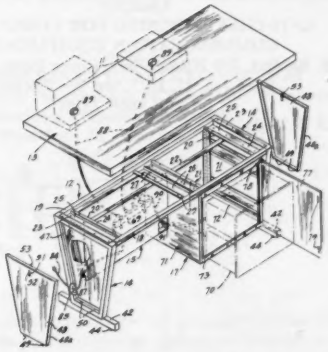
Filed Aug. 9, 1976, Ser. No. 712,753
Int. Cl.[2] A47B *17/00*

U.S. Cl. 312—195 **15 Claims**

1. A modular electronic desk assembly, comprising: a load supporting top structure comprising a frame unit of substantial length and width and having structural members for supporting a generally horizontal working area top panel firmly against sagging under load;

pylons each comprising an enclosed compartment and being for upright disposition in supporting relation under each end portion of the frame unit and with each of said pylons having a removable door which doors face in opposite directions away from one another;

an electrical equipment compartment supported on said frame unit beneath said top panel between said pylons, a cable compartment carried by said frame unit beneath and in abutment with said frame unit and having a cable compartment opening and said electrical equipment compartment having an opening interfacing with said cable compartment opening to allow the passage of electrical wiring, the cable compartment further having at least one



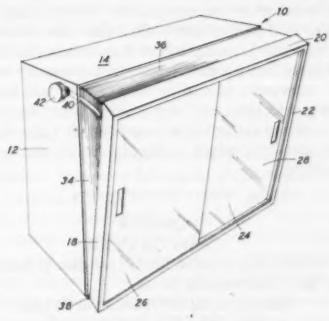
opening in interfering communication with an opening in at least one of said pylons for extension of wiring from the cable compartment into the pylon, and a hole in said at least one pylon to extend the electrical wiring exteriorly of the same for connection with an electrical outlet.

4,066,306

UTILITY CABINET WITH TILTING MIRRORED DOOR

Edward F. Klinder, 3621 S. Scoville Ave., Berwyn, Ill. 60402

Filed Sept. 27, 1976, Ser. No. 727,247
Int. Cl.[2] A47B *67/00;* **A47G** *1/00;* **G02B** *5/08;* **A47B** *49/00*
U.S. Cl. 312—224 **5 Claims**



1. Utility cabinet apparatus comprising a cabinet housing means having opening means therein, door frame means extending around said opening means and pivotally connected to said housing means for pivotally swinging a section of the edge of said frame means towards and away from said opening means, door means openably and closably mounted in said frame means for providing access to the inside of said housing means through said opening means, reflecting mirror surface means on said surface of said door means facing away from the interior of said housing means, retractable joint means extending from the periphery of said frame means to the periphery of said opening means so that when said frame means is pivoted away from said opening means the separation of the periphery of said frame means and the periphery of said opening means is closed off, said retractable joint means comprising wall means secured to the periphery of said frame means and is adapted to slidingly engage the periphery of said opening means and to

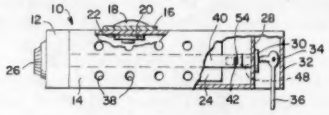
pivotally move into and away from said housing means with said frame means, clamp means clampingly engaging said wall means for positioning said frame means pivotally with respect to said opening means.

4,066,307

ANTI-THEFT HOUSING FOR VEHICULAR COMMUNICATION EQUIPMENT

Paul E. Barding, 249 Wilson Place, Crown Point, Ind. 46307

Filed Jan. 17, 1977, Ser. No. 759,885
Int. Cl.[2] E05B *13/02*
U.S. Cl. 312—242 **4 Claims**



1. An anti-theft housing for vehicular communication equipment comprising a housing, an escutcheon, said escutcheon having an opening therein, said opening being smaller in size than the front plate of a communication apparatus, a pair of arms extending outwardly from said opening and parallel to each other, said housing having an access port passing through a wall thereof, said communication apparatus being disposed partially passing through said port and partially residing within said housing when said escutcheon clampingly engages said front plate intermediate said escutcheon and said housing, said pair of arms being disposed within said housing when said escutcheon clampingly engages said front plate intermediate said escutcheon and said housing, a lock, said lock having a lock housing, said lock housing fixedly secured to a wall of said housing opposite to said wall having said port therein, a pair of rods extending outwardly from said lock, one end of each of said pair of rods operably positioned by locking and unlocking said lock into and out of engagement with openings located in the ends of said pair of arms when said pair of arms are disposed within said housing, a plate fixedly secured to said housing, said plate located parallel to the keyway opening of said lock and outwardly of said housing, a key, said key operably controlling said lock, said key having a bar fixedly secured thereto, said bar extending substantially at right angles to the length of said key, means to fixedly secure said housing to a motor vehicle.

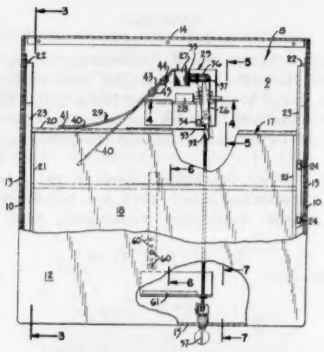
4,066,308

CASH DRAWER

Mark J. Wedel, Minneapolis, Minn., assignor to Atlas Manufacturing, Inc., Minneapolis, Minn.

Filed Jan. 21, 1977, Ser. No. 761,015
Int. Cl.[2] A47B *88/04, 88/16*
U.S. Cl. 312—333 **11 Claims**

1. A cash drawer assembly comprising:
a. a housing including a frame having a bottom wall and laterally spaced side walls;
b. a drawer having front and rear walls and side walls;
c. support means mounting said drawer in said housing for forward opening and rearward closing movements;
d. latch means releasably holding said drawer in a closed position;
e. operating means for said latch means;
f. elongated, normally straight flexible resilient rod means for urging said drawer toward its open position;
g. bracket means for supporting said rod means in said housing at an oblique angle to the direction of movement of said drawer for engagement of one end of the rod means by said drawer, whereby said rod means is rearwardly bent by said drawer during closing movements of the drawer;
h. and clamping means securing the other end of said rod means to said bracket means for adjustment of said rod means longitudinally thereof on said bracket means,



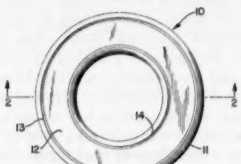
whereby to vary the effective bending length of said rod means.

4,066,309

WATER VAPOR RELEASING COMPOSITION OF MATTER AND DEVICE, AND PROCESS FOR THEIR USE

Stephen J. Hellier, Milan, Italy, assignor to S.A.E.S. Getters S.p.A., Milan, Italy

Filed Mar. 10, 1975, Ser. No. 556,929
Claims priority, application Italy, Mar. 12, 1974, 86232/74
Int. Cl.[2] H01J *9/38*
U.S. Cl. 316—5 **8 Claims**



1. A method for introducing water vapor into an electron tube comprising the steps of:
1. introducing particulate hydrated alumina into the tube,
2. heating the hydrated alumina to release water vapor, in which the heating comprises two steps:
A. heating the hydrated alumina by baking-out said tube to a first temperature to release a first amount of water vapor, and then after completion of the bake out,
B. heating the hydrated alumina by induction heating to a higher temperature to release a second amount of water vapor.

4,066,310

METHOD FOR INTRODUCING A HIGH VOLTAGE CONDUCTOR INTO A TELEVISION CATHODE RAY TUBE

Kazimir Palac, Carpentersville, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jan. 3, 1977, Ser. No. 756,205
Int. Cl.[2] H01J *9/18*
U.S. Cl. 316—19 **4 Claims**

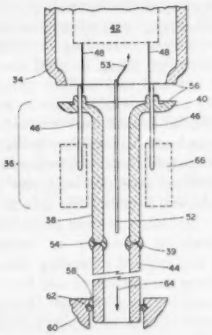
1. In the manufacture of a television cathode ray tube which includes an envelope with a narrow neck at one end, a method of introducing a high-voltage electrical conductor through the neck of the tube, comprising:
providing a gun-base assembly comprising a hollow glass

stub tubulation on one end of which is an annular glass base carrying an electron gun assembly, and on the distal end of which is temporarily secured a hollow holder;

providing an electrical conductor which passes through said stub tubulation;

inserting said gun-base assembly into said neck of said tube and hermetically bonding said base to said neck;

evacuating said tube through said stub tubulation and said temporary holder;



applying heat circumferentially to said stub tubulation between said distal end of said stub tubulation and said base to soften and pinch off said tubulation, sealing the evacuated tube against re-entry of air; and

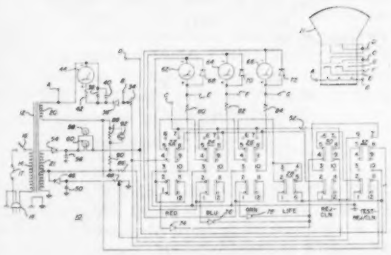
detaching said temporary holder from said stub tubulation to form a cup in said end of said tubulation for receiving an electrical connector.

4,066,311

MULTIPLE GUN CATHODE RAY TUBE TESTING, CLEANING, AND REJUVENATING APPARATUS

Daniel A. Poulson, Stevensville, Mich., assignor to Heath Company, Benton Harbor, Mich.

Filed Feb. 22, 1977, Ser. No. 770,429
Int. Cl.² H01J *9/50*
U.S. Cl. 316—28 **13 Claims**



1. Apparatus for restoring electron emission of the cathodes of multiple electron gun cathode ray tubes, said tubes having a heater and each electron gun having a cathode and a control grid, said apparatus having means for connection to the cathode ray tube being restored and comprising:

a potential source of supplying power to said heater;

an alternating current power source;

a direct current power source;

current flow indicating means for connection in the cathode to control grid circuits of said electron guns; and

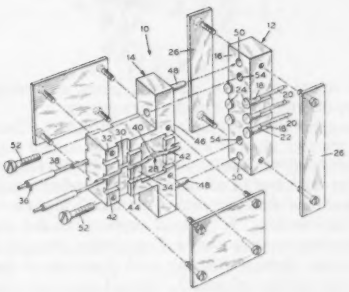
switching network means coupled to said alternating current power source and said direct current power source and having a first switch configuration for coupling said direct current power source across the control grid and cathode of one of said electron guns and rejuvenating the cathode of that one electron gun and a second switch configuration for coupling said alternating current power source across the control grid and cathode of said one of said electron guns and cleaning the cathode of that one electron gun and further comprising a plurality of switch elements for selecting said one of said electron guns.

4,066,312

HIGH DENSITY CABLE CONNECTOR

Louis H. Faure, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 28, 1976, Ser. No. 700,275
Int. Cl.² H01R *15/22*
U.S. Cl. 339—48 **8 Claims**



1. A connector for forming a plurality of electrical wiring connections comprising:

a first mateable coupling member having a flat surface, a plurality of openings in said first member arranged in a predetermined configuration,

a plurality of headed elements disposed in said plurality of openings, said headed elements adapted to be attached to a plurality of electrical wires,

a second mateable coupling member provided with a flat surface,

a set of elongated flexible metal buckling beam elements, said elements each comprised of a laterally flexible electrically conductive wire having a length that is many times its diameter, said wire having an anchoring portion adjacent one end, a long flexible central portion, and an end portion opposite said anchoring portion, on the other end,

support means on said second member for releasably supporting said set of buckling beam elements in aligned positions relative to said plurality of headed elements on said first member with said buckling beam elements protruding slightly beyond said flat surface, said support means including a means to engage said anchor portions of each of said buckling beams to thereby prevent axial movement, means to support said end portion of each of said buckling beams for longitudinally slideable movement, and an enclosure which allows flexing of the central portion of said buckling beam in a single plane, said enclosure including surfaces at opposite sides of said central portions which block said central portions from flexture in directions transverse to said single plane, .

alignment means for aligning said first member and said second member in mateable relation with the respective flat surfaces in opposed relation and with the protruding ends of said set of beam elements in contact with a plurality of headed elements, and

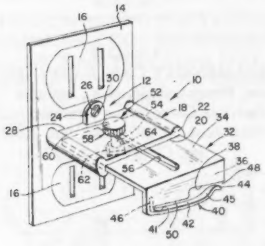
securing means for maintaining said first member and second member in mateable relation and with said beam elements in flexed positions.

4,066,313

SAFETY GUARD FOR ELECTRICAL PLUGS

Tronje von dem Hagen, 64 Doherty Drive, Clifton, N.J. 07013

Filed Aug. 3, 1976, Ser. No. 711,240
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—75 P **7 Claims**



1. A safety guard for electrical plugs and multiple plug adaptors inserted in receptacles, comprising:

a. a support element adapted to be affixed by affixing means to the face plate of a receptacle outlet, said support element being substantially transverse to said receptacle face plate and having a substantially longitudinal opening in an edge thereof further most from said face plate;

b. a substantially "L" shaped support bracket adapted to slideably cooperate on a first portion thereof with said support element through said longitudinal opening, a second portion of said "L" shaped support bracket defining a slot therein and adapted to engage within the slot a cord affixed to a plug inserted in said receptacle outlet, said "L" shaped support bracked retaining said plug within said receptacle;

c. means for removably securing said cord within said slot; said removable securing means comprising a spring urged member affixed to said second portion and adapted to close the open end of said slot and secure the cord, and

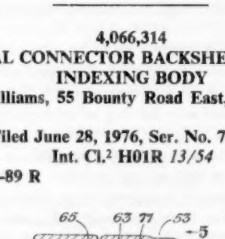
d. means for adjustably securing said support bracket to said support element.

4,066,314

ELECTRICAL CONNECTOR BACKSHELL ACCESSORY INDEXING BODY

Robert A. Williams, 55 Bounty Road East, Fort Worth, Tex. 76116

Filed June 28, 1976, Ser. No. 700,392
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—89 R **5 Claims**



1. An electrical connector backshell accessory body adapted to be rotatably confined within a coupling nut of the type having threads formed on its inside at one end and an inward extending shoulder spaced from said threads and located between said threads and the other end of said nut, said accessory body comprising:

a hollow cylindrical member having a first end with an outside diameter sufficient to allow it to freely pass through said coupling nut and an outward extending shoulder located at its other end and having an outside diameter greater than the inside diameter of said inward extending shoulder of said coupling nut,

threads formed on the outside of said outward extending shoulder of said hollow cylindrical member to allow said outward extending shoulder to be threaded into and beyond said threads formed on the inside of said nut to locate said outward extending shoulder between said threads and said inward extending shoulder of said nut with said first end of said hollow cylindrical member extending beyond said other end of said nut,

said threads and inward extending shoulder of said nut confining said outward extending shoulder of said hollow cylindrical member when located therebetween but allowing said nut and said hollow cylindrical member to move slightly axially with respect to each other,

the outside diameter of said outward extending shoulder of said hollow cylindrical member being slightly less than the inside diameter of said nut between its threads and its inward extending shoulder whereby said nut and said hollow cylindrical member are free to rotate relative to each other when said outward extending shoulder of said hollow cylindrical member is located between said threads and said inward extending shoulder of said nut,

threads formed on the outside of said first end of said hollow cylindrical member to allow said first end to be threaded into a backshell accessory member when said first end of said hollow cylindrical member extends beyond said other end of said nut,

teeth formed on said other end of said hollow cylindrical member for engaging the teeth of an electrical connector when it is threaded into the threads of said nut and

a self-locking O-ring located between the outside wall of said accessory body and the inside wall of said coupling nut when said accessory body is confined by said coupling nut,

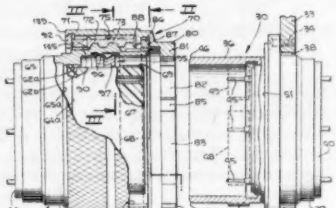
said self-locking O-ring being located between said inward extending shoulder and said other end of said coupling nut.

4,066,315

ELECTRICAL CONNECTOR WITH ARCUATE DETENT MEANS

Hal Arneson, Lawton, N. Dak., assignor to Automation Industries, Inc., Los Angeles, Calif.

Filed July 26, 1976, Ser. No. 708,475
Int. Cl.[2] H01R *3/00, 13/54*
U.S. Cl. 339—89 M **11 Claims**



1. In an electrical connector having a receptacle means including a receptacle shell and a plug means including a plug shell, a coupling nut threaded on said plug shell, and a coupling ring housing keyed to said coupling nut, electrical contact elements carried within said receptacle and plug shells for electrically mating and unmating, and lock means on said coupling housing and said receptacle shell for releasably holding said contact elements in mating relation, the provision of:

means for audibly indicating fully mated and locked relationship of said receptacle means and plug means, said indicating means including

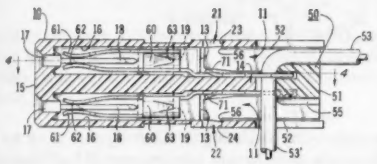
an internal annular groove in said coupling housing;
a keyway on said plug shell;
and an arcuate resilient detent member in said annular groove and having a key engaged in said keyway;
said detent member having radially outwardly directed end portions;
said annular groove having spaced sets of radially outwardly located recesses to selectively receive said end portions;
whereby when said housing is rotated to full locked and mated position, said end portions are urged out of one set of recesses and forcibly audibly engaged in a second set of recesses.

4,066,316

ELECTRICAL CONNECTOR CONSTRUCTION

Robert William Rollings, Auburn, Ala., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 11, 1976, Ser. No. 740,843
Int. Cl.[2] H01R *9/08, 13/54*
U.S. Cl. 339—91 R **13 Claims**



1. An electrical connector construction comprising a receptacle housing having a first face and a second, opposite face and a slotted cavity opening on said first face, said housing further having a plurality of apertures extending from said cavity to said second face and a recess in a wall of said housing transverse to and within said cavity to present a detent lip; a plurality of electrical contact terminals fitted respectively in said apertures, each of said terminals presenting a terminal pin socket at said second face and a bifurcated conductor seizing blade at said first face; and a comb plug member dimensioned for insertion in said housing cavity, said plug member having a plurality of fingers extending therefrom for positioning conductors therebetween in registration with said conductor seizing blades, each of said fingers being terminated in a pawl, each of said contact terminal blades further having a tab spring extending therefrom for urging toward and locking into engagement, one of said finger pawls with said detent lip as said plug member is inserted in said housing cavity.

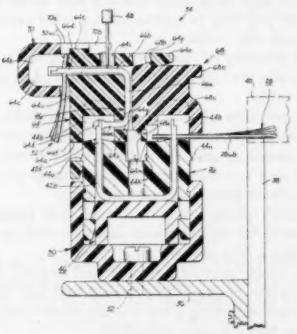
4,066,317

ELECTRICAL CONDUCTOR TERMINATING SYSTEM

Herbert H. Bierenfeld, Doraville; Charles McGonigal, Grayson, both of Ga.; Chauncey M. Horton, Jr., and John A. Kelsey, both of North Andover, Mass., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Sept. 30, 1976, Ser. No. 728,337
Int. Cl.[2] H01R *9/08*
U.S. Cl. 339—91 R **23 Claims**

1. An electrically insulating terminal support block for holding electrical terminals having a bight portion and spaced legs projecting from opposite ends of the bight portion, which comprises:
a body portion;
electrical conductor guide portions projecting from one side of said body portion in a first direction and spaced apart to define electrical conductor-receiving slots therebetween;
first spaced insulating ribs in said guide portions defining slots for receiving respective ones of the legs of the terminals in insulated relationship;
second spaced insulating ribs on said body portion defining slots for receiving the bight portions of the terminals in insulated relationship;
a pair of resilient legs having outer free ends and each projecting outward with respect to said body portion in a different direction than the first direction in which said electrical conductor guide portions project from said



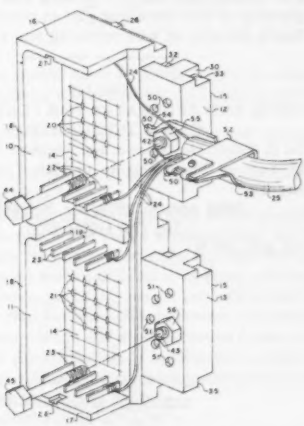
body portion, said legs being spaced apart to permit the terminals to be inserted into and removed from said guide portions and said first and second ribs of the support block; and
connecting means adjacent the outer free end of at least one of said resilient legs for assembling the support block to a member for retaining the terminals in the support block.

4,066,318

ELECTRICAL CONNECTOR ASSEMBLY

David L. Vonder, Addison, and Anthony J. Wilkis, Downers Grove, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed July 15, 1976, Ser. No. 705,659
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—92 M **5 Claims**



1. An electrical connector assembly of the type which affords cable wire interconnections comprising:
a pin connector including,
a partial enclosure having a floor comprising a front surface and a rear surface, a first end wall, a second end wall, and a side wall, said first end wall, said second end wall and said side wall extending forward from said floor front surface, said partial enclosure also including a divider wall

extending forward from said floor front surface and defining first and second aligned partial enclosure portions,

a first plurality of apertures extending through said floor within said first portion and arranged in a predetermined array,

a first plurality of wire receiving pins within said first plurality of apertures, said first plurality of pins extending forward of said floor front surface and terminating within said first plurality of apertures at a point intermediate said front and rear surfaces,

a second plurality of apertures extending through said floor within said second portion and arranged in said predetermined array,

a second plurality of wire receiving pins within said second plurality of apertures, said second plurality of pins extending forward of said floor front surface and terminating within said second plurality of apertures at a point intermediate said front and rear surfaces,

a first block portion adjacent said first partial enclosure portion on the side opposite said side wall, said first block including a first alignment key, and

a second block portion adjacent said second partial enclosure portion on the side opposite said side wall, said second block including a second alignment key; and

a terminal block means including,

a first terminal block having a first planar major surface, and a third plurality of wire receiving pins arranged in said predetermined array and extending forward of said first planar surface,

a second terminal block substantially identical to said first terminal block having a second planar major surface, and a fourth plurality of wire receiving pins arranged in said predetermined array and extending forward of said second planar surface, and

a bracket for aligning and securing said first and second terminal blocks together and having first and second key slots for receiving said first and second alignment keys, respectively;

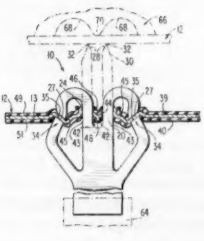
whereby, when said pin connector and said terminal block means are brought together, said first and second alignment keys and said first and second key slots respectively engage for aligning said first and second plurality of apertures with said third and fourth plurality of wire receiving pins respectively and for causing said first and second plurality of wire receiving pins to contact said third and fourth plurality of wire receiving pins respectively.

4,066,319

METHOD AND APPARATUS FOR FLAT CONDUCTOR CABLE TERMINATION

Charles E. Baker, Doylestown, and Abraham Silverzweig, Broomall, both of Pa., assignors to Elco Corporation, Willow Grove, Pa.

Filed Apr. 30, 1974, Ser. No. 465,594
Int. Cl.[2] H01R 9/06
U.S. Cl. 339—97 R **16 Claims**



1. A contact apparatus for flexible flat conductor means comprising:

penetrating means for penetrating completely through a conductor portion of said flat conductor means to provide at a first location electrical contact between said conductor portion and said contact apparatus; and

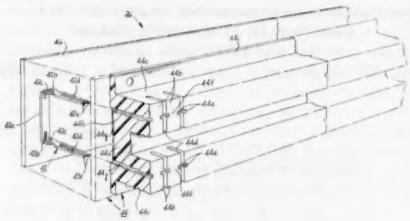
crimping means including spring means cooperable with said penetrating means for forming a biased electrical contact at a second location on said conductor portion.

4,066,320

ELECTRICAL CONDUCTOR TERMINATING SYSTEM

Allen R. Goodrich, Groveland; Chauncey M. Horton, Jr., North Andover, both of Mass.; Leigh M. Thaeler, Derry, N.H., and John O. Toivola, Haverhill, Mass., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Sept. 30, 1976, Ser. No. 728,340
Int. Cl.[2] H01R 9/08
U.S. Cl. 339—98 **10 Claims**



1. An electrically insulating terminal support block for electrical terminals each having interconnected legs disposed in spaced opposed relationship, which comprises:

a body portion;

sets of electrical conductor guide portions projecting outward with respect to one side of said body portion such that said guide portions and surface portions of the one side of said body portion between said guide portions define a channel between said guide portions;

said sets of electrical conductor guide portions being in spaced opposed relationship on opposite sides of the channel defined by said guide portions and the surface portions of the one side of said body portions;

each of said electrical conductor guide portions being spaced from adjacent guide portions to define electrical conductor-receiving slots therebetween of substantial depth in comparison to the spacings between the guide portions; and

electrical terminal leg-receiving slots formed in the support block for receiving the legs of the electrical terminals, the leg-receiving slots being formed in part in opposed walls of respective ones of the electrical conductor-receiving slots defined by the spaced electrical conductor guide portions, extending from the electrical conductor-receiving slots to an opposite side of said body portion, and being open-ended adjacent the opposite side of said body portion for the reception of the legs of the terminals with one leg of each terminal entering one of the leg-receiving slots on one side of said channel and the other leg entering one of the leg-receiving slots on the other side of said channel.

4,066,321

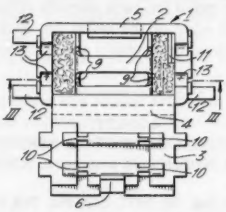
ELECTRICAL CONNECTOR

Francisco Villazon, Barcelona, Spain, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 30, 1976, Ser. No. 755,523
Claims priority, application United Kingdom, Jan. 17, 1976, 1846/76
Int. Cl.[2] H01R 7/04
U.S. Cl. 339—98 **3 Claims**

1. An improvement to an electrical connector of the type having a housing having notches on its end walls and contain-

ing first and second electrical contacts with each contact having spaced apart wire-receiving slotted plates, said plates being in alignment with said notches, and at least one wire severing edge associated with at least one of said notches and a closure



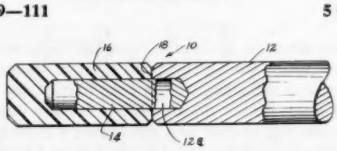
member adapted to force insulated wires into the slotted plates and to force at least one wire across the wire severing edge, the improvement comprising, an external boss on the housing adjacent each of said notches through which the wires may extend after being forced into the slotted plates.

4,066,322

MALE CONTACT ASSEMBLY FOR USE IN LOADBREAK

Robert R. Brown, Bernardsville, and David E. Bressler, Long Valley, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed Aug. 6, 1976, Ser. No. 712,385
Int. Cl.[2] H01R *13/52*
U.S. Cl. 339—111 **5 Claims**



1. A male contact assembly comprising:
a. an elongate male contact of electrically conductive material;
b. an electrically insulative member secured to said male contact and extending longitudinally therefrom, said insulative member defining a hollow interior extending at least partly therewith;
c. a solid electrically conductive element in said insulative member interior and connected to said male contact for electrically longitudinally extending said male contact; and
d. a longitudinally extending layer overlying said insulative member and comprised of material generating arc-extinguishing gases upon exposure to electrical arcing, the longitudinal extent of said layer being greater than the longitudinal extent of said element in said insulative member.

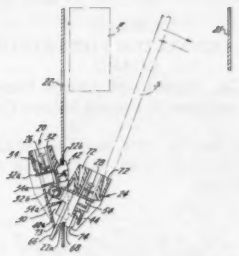
4,066,323

ELECTRICAL TERMINAL BLOCKS

Alexander R. Norden, 350 Central Park South, New York, N.Y. 10025

Division of Ser. No. 542,293, Jan. 20, 1975, Pat. No. 4,027,937.
This application Nov. 8, 1976, Ser. No. 739,782
Int. Cl.[2] H01R *9/10, 13/60, 13/62*
U.S. Cl. 339—126 R **10 Claims**

1. In combination, a terminal block and a companion plug-in unit having cooperable electric contacts, said plug-in unit being wholly separable from said terminal block, said plug-in unit having a separable hinge formation adapting the plug-in unit for pivotal operation about a fulcrum into plugged-in engagement with and removal from said terminal block, said plug-in unit having means for establishing unitary cooperation with an elongated tool which then becomes a lever extension of the plug-in unit providing leverage about said fulcrum to aid in insertion of the plug-in unit into plugged-in assembly with the terminal block and to aid in extraction of the plug-in unit from such assembly, said means for establishing unitary coop-



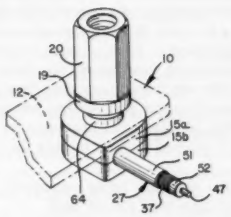
eration with such tool including a tool-engagement formation adapted to mate with a complementary formation of the tool in such a manner that the tool and the plug-in unit form an elongated member operable about the fulcrum.

4,066,324

SOLDERLESS COAXIAL CABLE TERMINATOR

Gerald D. Stephens, Vandalia, Ohio, assignor to Valor Enterprises, Inc., West Milton, Ohio

Filed Feb. 11, 1977, Ser. No. 767,901
Int. Cl.[2] H01Q *1/50*
U.S. Cl. 339—126 J **11 Claims**



1. A solderless coaxial cable terminator for supporting and electrically terminating a coaxial cable on a conductive frame, comprising:
a. a body divided into complementary first and second portions,
b. means defining a channel in said body portions for receiving a coaxial cable therein,
c. means for securing said body portions to one another and to the conductive frame with a predetermined portion of said first body portion held securely adjacent the frame,
d. means forming a path in said first body portion for leading the shield conductor of the coaxial cable from said channel to a position between said predetermined portion of said first body portion and the conductive frame, and for securing the shield conductor in electrical contact with the conductive frame, for completing the ground circuit thereto,
e. a signal conductor,
f. conductive securing means in electrical contact with said signal conductor and held securely adjacent a predetermined portion of said second body portion,
g. means insulating said signal conductor and said conductive securing means from the conductive frame, and
h. means forming a path in said second body portion insulated from the conductive frame for leading the center conductor of the coaxial cable from said channel to a position between said predetermined portion of said second body portion and said conductive securing means,

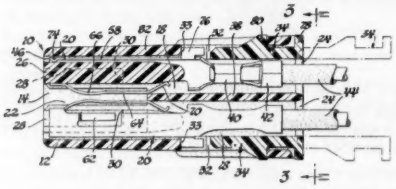
and for securing the center conductor in electrical contact with said conductive securing means, for completing the circuit thereto and thence to said signal conductor from the coaxial cable center conductor.

4,066,325

ELECTRICAL CONNECTOR FOR PRINTED CIRCUIT BOARD

Warren Pearce, Jr., Warren, and Andrew Russo, Jr., Fowler, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 15, 1976, Ser. No. 732,925
Int. Cl.[2] H01R *13/46, 13/42;* **H05K** *1/07*
U.S. Cl. 339—176 MP **8 Claims**



1. An electrical connector for a printed circuit board or the like comprising:

a connector body having a lateral slot at a forward end and a plurality of longitudinal terminal receiving cavities,

each of said cavities having a forward longitudinal opening through which said cavities communicate with said lateral slot, a rear opening and a central side rib protruding laterally into a forward portion thereof, and

a terminal disposed in each of said cavities,

said terminal being configured for insertion into its associated cavity via the rear opening thereof and comprising a U-shaped forward end portion having first and second parallel legs in piloting engagement with said side rib,

a rearward U-shaped portion having third and fourth parallel legs,

said U-shaped portions being connected to each other by interconnecting wall means, and

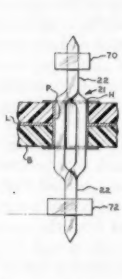
a resilient tongue portion connected to one of said first and second parallel legs of said U-shaped forward end portion and extending rearwardly in cantilever fashion with portions thereof disposed in said lateral slot.

4,066,326

CIRCUIT BOARD CONTACT

Charles Michael Lovendusky, Enola, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 513,593, Oct. 10, 1974, abandoned. This application Apr. 5, 1976, Ser. No. 673,698
Int. Cl.[2] H01R *9/16*
U.S. Cl. 339—221 M **8 Claims**



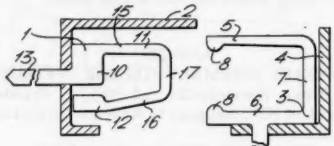
1. An elongated circuit board contact including a deformed mounting portion for insertion in a hole in a circuit board and a solid, uniform cross section segment at each end of the mounting portion, said segments having substantially the same cross section, said mounting portion consisting of a radial fin having an edge adjacent the longitudinal axis of the contact and a pair of fins laterally offset and extending in the opposite direction from the radial fin, each laterally offset fin having an edge adjacent said edge of the radial fin, each fin extending lengthwise of the mounting portion and being joined at its ends to said segments.

4,066,327

ELECTRICAL CONNECTOR ASSEMBLIES

Lucas Soes, Vught, Netherlands, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 28, 1977, Ser. No. 763,731
Claims priority, application United Kingdom, Feb. 21, 1976, 06913/76
Int. Cl.[2] H01R *13/06*
U.S. Cl. 339—252 R **5 Claims**



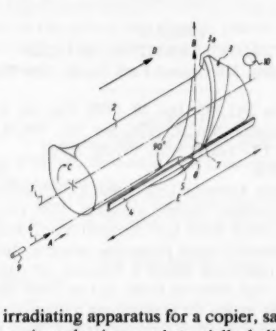
1. An electrical connector assembly comprising a forked female contact having first and second spaced cantilever contact arms extending from a yoke portion and receiving a mating male contact, the second contact arm being stiff relative to the first contact arm and having a member extending outwardly from it, the male contact having a base and a resilient contact arm having a first portion extending forwardly from the base to a first junction, a second portion extending from the first junction at substantially 90° to the first portion to a second junction and a third portion extending from the second junction generally rearwardly, the male contact entering the female contact by outward flexure of the first contact arm of the female contact and inward flexure of the third portion of the contact arm of the male contact.

4,066,328

IRRADIATING SYSTEM FOR LINE-BY-LINE COPIER

Rudolf Paulus, Munich; Walter Gutmann, Lochhofen, and Wilfried Hofmann, Taufkirchen, all of Germany, assignors to AGFA-Gevaert, AG, Leverkusen, Germany

Filed Apr. 28, 1976, Ser. No. 681,032
Claims priority, application Germany, Apr. 30, 1975, 2519283
Int. Cl.[2] G02B *27/17*
U.S. Cl. 350—7 **10 Claims**



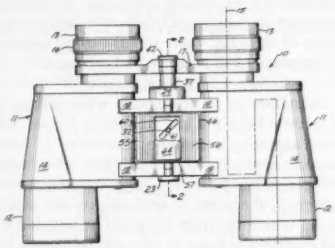
1. An irradiating apparatus for a copier, said apparatus comprising: a mirror having a substantially helical reflecting sur-

face centered on a central axis and inclined to radii of said axis; means for rotating said mirror about said axis; means including a fixed light source for casting a beam of light in an incident direction generally parallel to said axis onto said mirror, whereby said beam is reflected from said surface in a first reflection direction outwardly of said axis; and means including a reflector extending the full axial length of said surface and fixed adjacent said mirror for reflecting the reflected beam back onto said surface in a second reflection direction so that said beam is again reflected by said mirror in a third reflection direction lying in a plane substantially orthogonal to said axis.

4,066,329
OPTICAL ADJUSTMENT KNOB WITH SPACED APART PLATFORMS

Gerrit A. Van Exel, Fullerton, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Oct. 9, 1975, Ser. No. 620,969
Int. Cl.[2] G02B *7/06, 7/04*
U.S. Cl. 350—77 **12 Claims**



1. A binocular comprising:

a. first and second telescopes, each of the telescopes including a body portion and a movable optical element, the optical elements being movable with respect to the body portions to effect an optical adjustment;

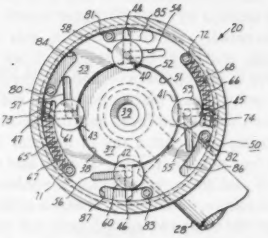
b. connecting means secured to the body portions for connecting the telescopes together and to provide an interpupillary spacing adjustment for the telescopes, the means including a hinge pin having a longitudinal axis and a bracket hinged to rotate about the hinge pin;

c. an assembly for moving the optical elements, the assembly including a rotatable knob and a coupling means for coupling the knob to the movable optical elements, the knob including a hub portion which is mounted between the body portions for rotation about the longitudinal axis of the hinge pin, the knob also including first and second spaced-apart finger-contacting portions spaced relative to the hub portion so that, when the binocular is held by a user with one of the user's hands gripping the first telescope and the other of the user's hands gripping the second telescope, the first finger-contacting portion is positioned relative to the first telescope so as to be easily contacted by at least one finger of the one hand and the second finger-contacting portion is positioned relative to the second telescope so as to be easily contacted by at least one finger of the other hand whereby the knob can be rotated bidirectionally in seesaw-like fashion by the fingers of the hands without any shift in grip positioning of the hands.

4,066,330
COUPLER FOR JOINING OPTICAL DEVICES

Eric Mynard Jones, Los Angeles, Calif., assignor to Karl Storz Endoscopy-America, Inc., Los Angeles, Calif.

Filed June 14, 1976, Ser. No. 697,431
Int. Cl.[2] G02B *9/04;* **F16D** *1/00*
U.S. Cl. 350—80 **26 Claims**

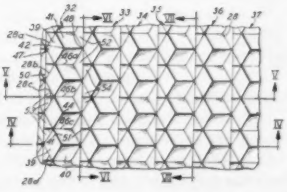


1. A coupler for joining optical devices, one of which carries a peripheral flange with a shoulder, said coupler comprising: a plurality of retainer studs, each retainer stud including a post and a shoulder on said post; a body having an axis, a socket at least in part defined by a base disposed normal to said axis, and a sidewall, a plurality of apertures through said sidewall, a plurality of substantially radially-extending guide slots, each aligned with a respective aperture, one of said posts being slidably fitted into each of said guide slots, and an observation port through the base; an actuating ring rotatably mounted to the body and including a plurality of ramp slots, one respective to each of said guide slots, each said ramp slot being disposed obliquely relative to its respective guide slot when viewed in plane and also obliquely to a plane normal to the guide slot, the ramp slots and guide slots overlaying one another in pairs with the respective posts passing through both of them at their projected intersection, rotation of the actuating ring moving the projected intersection of the slots radially inward or outward, depending on the direction in which the ring is turned, the posts moving correspondingly and, when the posts are at their innermost radial location, their shoulders project through respective apertures to overhang the shoulder carried by said one optical device to hold the optical devices together, and when the actuating ring is turned to move the posts radially outward, withdrawing the shoulders of the retainer studs so they clear the shoulder on the said one optical device.

4,066,331
CUBE CORNER TYPE RETROREFLECTORS WITH IMPROVED CUBE CORNER UNIT RELATIONSHIPS

Henry Lindner, Wood Dale, Ill., assignor to Beatrice Foods Co., Elgin, Ill.

Filed June 25, 1976, Ser. No. 699,886
Int. Cl.[2] G02B *5/124*
U.S. Cl. 350—103 **8 Claims**



1. In a cube corner-type retroreflector of the type comprising a molded, substantially transparent body having a front face with a generally smooth, flattened portion which is in spaced, generally parallel relationship to a portion of a rear face thereof, the improvement which comprises

A. a rear face portion having defined therein a plurality of rows, each said row having defined therein a plurality of individually complete cube corner retroreflective units, each row being defined by a pair of spaced, parallel edges,

B. said complete retroreflective units comprising each row being substantially identical to each other, each complete cube corner retroreflective unit in an individual said row being defined by three flat faces which are arranged circumferentially about an optical axis extending therethrough, said three faces being inclined at a similar angle relative to said optical axis, and said three faces meeting an apex point along said optical axis, the interrelationship between said three faces and the associated said optical axis being such that a ray of incident light striking said front face portion, passing through said body and striking one of said three faces within a predetermined range of angles relative to said optical axis is deflected successively against the other two of said faces and then is substantially retroreflected away from said unit and out through said front face portion,

C. said complete retroreflective units comprising each row having substantially parallel respective said optical axes, all complete retroreflective units comprising each row having substantially coplanar respective said apex points, and all said optical axes being substantially perpendicular to such plane defined by said apex points,

D. adjacent pairs of said complete retroreflective units in each row having a common edge therebetween,

E. each said complete retroreflective unit of each said row having a pair of opposed face corners at the perimeter thereof, each one of said opposed face corners coinciding substantially with a different one of said row edges of the associated row thereof, and

F. regions of each said row located laterally of each said retroreflective unit and adjacent both of said row edges being occupied by faces which are not associated with complete tube corner retroreflective units.

4,066,332

REAR PROJECTION SCREENS

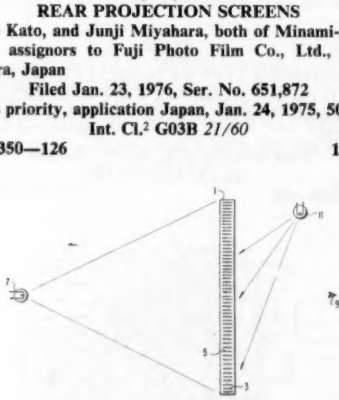
Hisatoyo Kato, and Junji Miyahara, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jan. 23, 1976, Ser. No. 651,872

Claims priority, application Japan, Jan. 24, 1975, 50-10240

Int. Cl.[2] G03B *21/60*

U.S. Cl. 350—126 **12 Claims**



1. A rear projection screen comprising a light diffusion plate formed of a material selected from the group consisting of wax, a crystalline polymer and mixtures thereof, and light shielding layers contai • d in said light-diffusion plate, said light shielding layers being parallel to the direction of image projection.

4,066,333

METHOD OF CONTROL OF A LIQUID-CRYSTAL DISPLAY CELL

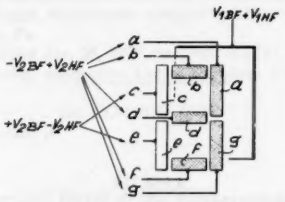
Bruno Dargent, Grenoble, and Jacques Robert, Saint Egreve, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 18, 1976, Ser. No. 687,742

Claims priority, application France, May 30, 1975, 75.17050

Int. Cl.[2] G02F *1/13*; G08B *23/00*

U.S. Cl. 350—160 LC **5 Claims**



1. A method of sequential control of a liquid-crystal display cell comprising a liquid-crystal film interposed between a first group of electrodes and a second group of electrodes, overlapping of one electrode of the first group by one electrode of the second group defining an excitable zone of the liquid-crystal film, said liquid crystal having dielectric anisotropy and a critical frequency at which said dielectric anisotropy undergoes a change of sign, the value of anisotropy being ϵ_1 below said critical frequency and ϵ_2 above said critical frequency, said liquid-crystal assuming a first optical state "0" corresponding to a first orientation of its molecules when subjected to an alternating electric field at a low frequency below said critical frequency and assuming a second optical state "1" corresponding to a second orientation of its molecules when subjected to an alternating electric field at a high frequency above said critical frequency, the steps of applying on the electrodes of the first group which controls the point at which it is desired to effect the display a voltage at said low frequency having an RMS values of V_{1BF} and a voltage at said high frequency having an RMS value of V_{1HF} and a zero voltage on the other electrodes of the first group, applying on the electrodes of the second group which controls the points at which it is desired to effect the display a voltage at said low frequency having an RMS value of V_{2BF} and a voltage at said high frequency having an RMS value of V_{2HF}, said RMS values being related by the inequality:

$$\epsilon_1 (V_{1BF} - V_{2BF})^2 < \epsilon_2 (V_{1HF} + V_{2HF})^2$$

in the zones in which the state "0" is to be displayed and related by the contrary inequality in the zones in which the state "1" is to be displayed.

4,066,334

LIQUID CRYSTAL LIGHT DEFLECTOR

Adrian Forrest Fray, Malvern Link, and David Jones, Malvern, both of England, assignors to National Research Development Corporation, London, England

Filed Jan. 5, 1976, Ser. No. 646,834

Claims priority, application United Kingdom, Jan. 6, 1975, 496/75; June 26, 1975, 27180/75

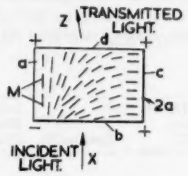
Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—160 LC **6 Claims**

1. An optical modulation device comprising:

two spaced transparent dielectric substrates, a layer of nematic liquid crystal material having a positive dielectric anisotropy sandwiched between the substrates, at least two electrodes spaced apart on the inner surface of one substrate and facing these electrodes at least two electrodes spaced apart on the inner surface of the other sub-

strate, means for producing electrical bias fields across the layer of liquid crystal material to produce a first condition in which molecules of the liquid crystal material are aligned by the field in a generally uniform direction and to produce separately a second condition in which the molecules of the liquid crystal material are oriented by the bias



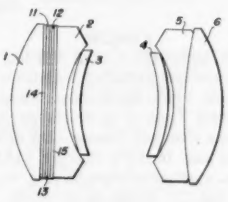
fields to provide a controlled refractive index gradient across the layer of liquid crystal material capable of refracting optical radiation having a plane of the gradient, the amount of the refraction being controlled by the bias fields, and means for changing the bias fields between the first and second conditions.

4,066,335

VARIABLE DENSITY LENS

John E. Courtney, Fairport; Charles J. Urso, Webster, and Gary A. Dir, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 19, 1976, Ser. No. 650,330
Int. Cl.² G02F *1/13*
U.S. Cl. 350—160 LC **3 Claims**



1. A variable density, split-Dagor lens, comprising a positive crown, a negative flint, a positive meniscus and an electro-optic cell laminated thereto; said electro-optic cell comprising in sandwich configuration a linear polarizer, a layer of conductive material, a liquid crystalline composition capable of altering the state of polarization of light when a voltage is applied thereacross, another layer of conductive material, and an analyzer.

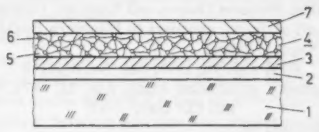
4,066,336

ELECTRODE FOR A CONTROLLABLE ELECTROCHROMIC INDICATOR DEVICE AND METHOD OF MANUFACTURE

Hans Rudolf Zeller, Birr, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Dec. 30, 1975, Ser. No. 645,430
Claims priority, application Switzerland, Jan. 6, 1975, 63/75
Int. Cl.² G02F *1/36*
U.S. Cl. 350—160 R **41 Claims**

1. Electrode for a controllable electrochromic indicator device with an electrochromic layer between a transparent first and a second electrode, the second electrode comprising a porous solid impregnated with a liquid electrolyte to form a



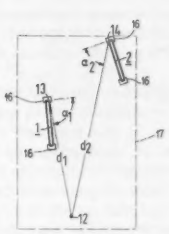
single layer second electrode, an electrical contact connected to the second electrode.

4,066,337

DISPLAY SYSTEM INCORPORATING A LIQUID CRYSTAL

Manfred Kobale, Faistenhaar; Hans Krüeger, Munich, and Hans-Peter Lorenz, Feldkirchen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 29, 1976, Ser. No. 736,957
Claims priority, application Germany, Oct. 31, 1975, 2548895
Int. Cl.² G02F *1/13*
U.S. Cl. 350—160 LC **23 Claims**



1. An improved display system comprising:

a. a pair of spaced generally parallel carrier plates at least one of which is light transmissive,

b. a pair of light transmissive electrode coatings, each one being associated with a different one respective inner adjacent opposed surface portion of one of said carrier plates,

c. a pair of light transmissive, electrically insulative coatings, each one being associated with a different one respective inner adjacent opposed surface portion of one of said carrier plates and located over its adjacent said electrode coating, each one of said insulative coatings having been vapor deposited at an oblique angle, one of said insulative coatings having been so deposited at an angle in excess of about 75°, the other of said insulative coatings having been so deposited at an angle less than about 65°,

d. mounting means sealing said carrier plates together in fixed relationship to one another and cooperating to define therebetween a chamber,

e. a liquid crystal layer in said chamber, said liquid crystal layer having positive dielectric anisotropy,

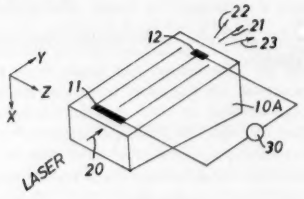
f. said insulative coating orientating the neighboring molecules substantially parallel to said plates, the direction of orientation at one of said plates being substantially vertical to the direction of orientation at the other of said plates,

g. a pair of electrical leads, each one being electrically associated with a different one of said electrode coatings and extending into the environment from said chamber.

4,066,338
ELECTROOPTIC LIGHT MODULATOR

Shuzo Hattori; Tadao Hiramatsu, both of Nagoya; Sunao Katayama, Aichi; Hidenori Ozawa, and Yasuyuki Hiraiwa, both of Nagoya, all of Japan, assignors to Hagiwara Denki Kabusiki Kaisha, Nagoya, Japan

Filed Apr. 16, 1976, Ser. No. 677,718
Claims priority, application Japan, Apr. 22, 1975, 50-48940
Int. Cl.[2] G02F *1/16*
U.S. Cl. 350—161 W **13 Claims**



1. In combination with an electrooptic light modulator comprising:

an electrooptic substrate having a first pair of opposing upper and lower surfaces defined by first and second rectangular coordinate axes, a second pair of opposing side surfaces, and a third pair of front and rear opposing surfaces;

interdigital electrodes provided on said upper surface to cause in said substrate and subjacent said upper surface an electrostatic field which is spatially periodic in the direction of said first axis and uniform in the direction of said second axis;

means to apply to said electrodes a voltage variable in accordance with a modulating signal; and

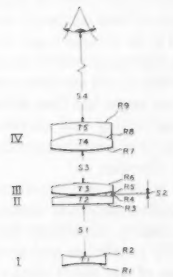
the front portion of said substrate adapted to receive an incident beam of electromagnetic energy having a flat aligned plane toward the direction of said second axis such that said flat beam propagates in the electrostatic field to emerge from said rear surface as modulated output beams;

the improvement wherein at least one of said lower surface and said side surfaces is non-parallel with the opposing surface thereto to prevent resonances of acoustic waves produced in said substrate by the electrostatic field.

4,066,339
OPTOMETER EYEPIECE

Arthur H. Shoemaker, East Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed July 16, 1976, Ser. No. 705,856
Int. Cl.[2] G02B *3/00, 9/34*
U.S. Cl. 350—175 E **2 Claims**



1. A four component optometer eyepiece being substantially free of chromatic aberration comprising a biconcave negative singlet I, a plano-convex positive singlet II, a biconvex positive singlet III and a biconvex positive doublet IV all aligned in sequence along an optical axis and having the values set forth below with axial thicknesses of the successive lens components being designated T_1 to T_5, successive axial spaces from the first component to an observer's eye being designated S_1 to S_4, successive lens radii being designated R_1 to R_9 where the minus sign (−) indicates surfaces whose center of curvature lies on an observer's side of their vertices, refractive indices and Abbe numbers are absolute values designated ND_1 to ND_5 and ν_1 to ν_5, respectively,

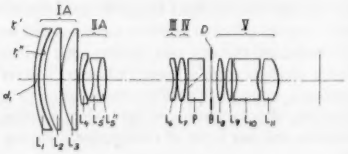
Lens	Radius(R)	Thickness (T)	Spacing(S)	Index of Refraction (ND)	Abbe No. ( )
	$R_1 = 0.90598x$				
		$T_1 = 0.034188x$		$1.58 < ND_1 < 1.60$	$\nu_1 = 61$
I	$R_2 = 0.90598x$		$S_1 = 0.28222x$		
	$R_3 = 100x$				
		$T_2 = 0.051282x$		$1.58 < ND_2 < 1.60$	$\nu_2 = 61$
II	$R_4 = 1.6036x$		$S_2 = 0.0008547x$		
	$R_5 = 1.5231x$				
		$T_3 = 0.068376x$		$1.58 < ND_3 < 1.60$	$\nu_3 = 61$
III	$R_6 = 0.89786x$		$S_3 = 0.17239x$		
	$R_7 = -1.8352x$				
		$T_4 = 0.08547x$		$1.58 < ND_4 < 1.60$	$\nu_4 = 61$
IV	$R_8 = 0.42966x$				
		$T_5 = 0.059829x$		$1.77 < ND_5 < 1.79$	$\nu_5 = 26$
	$R_9 = 1.1479x$		$S_4 = 0.9982x$		

and x is 115 to 119mm.

4,066,340
BASIC LENS ASSEMBLY FOR SERIES OF ZOOM OBJECTIVES OF DIFFERENT VARIFOCAL RATIOS

Walter Besenmatter; Trude Muszumanski, both of Vienna, and Irmgard Wendisch, Trumau, all of Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Aug. 10, 1976, Ser. No. 713,224
Claims priority, application Austria, Aug. 11, 1975, 6230/75
Int. Cl.[2] G02B *15/16, 17/00*
U.S. Cl. 350—184 **8 Claims**



1. A lens assembly forming part of a varifocal optical system of the type wherein a front lens group constituted by two stationary positive components bracketing two axially shiftable negative components adjoins an axially fixed rear lens group of positive refractivity consisting of a plurality of air-spaced lens members, said lens assembly comprising:

an axially shiftable negative lens L_6 constituting one of said negative components;

an axially fixed positive lens L_7 constituting one of said stationary components; and

two positive lenses L_8, L_9, a negative lens L_{10} and another positive lens L_{11} constituting said air-spaced lens members;

said lenses L_6 – L_{11} having radii of curvature $r_6' - r_{11}''$, axial thicknesses $d_6 - d_{11}$, refractive indices n_d and Abbe numbers ν_d substantially as given in the following table along

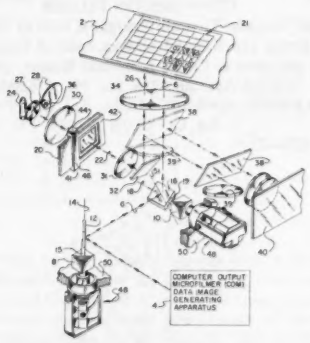
with air spaces $s_9 - s_{11}$ separating said lens members $L_8 - L_{11}$:

			n_d	ν_d
L_6	$r_6' = -0.87$ $r_6'' = -2.20$	$d_6 = 0.05$	1.78	44
L_7	$r_7' = +1.40$ $r_7'' = -1.75$	$d_7 = 0.12$	1.69	55
L_8	$r_8' = +2.19$ $r_8'' = -3.17$	$d_8 = 0.11$	1.74	45
		$s_9 = 0.03$		
L_9	$r_9'' = +0.74$ $r_9'' = \infty$	$d_9 = 0.12$	1.74	45
		$s_{10} = 0.04$		
L_{10}	$r_{10}' = -0.99$ $r_{10}'' = +0.57$	$d_{10} = 0.35$	1.85	24
		$s_{11} = 0.06$		
L_{11}	$r_{11}' = +1.69$ $r_{11}'' = -0.59$	$d_{11} = 0.23$	1.74	42

4,066,341
SCANNER ALIGNMENT MECHANISM

Alvin Louis Schubert, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 27, 1976, Ser. No. 690,480
Int. Cl.[2] G05D *25/00*
U.S. Cl. 350—285 **2 Claims**



1. A mechanism for effecting alignment of an axis of a mirror or other optical element in first and second perpendicular planes, the mechanism comprising:

A first mounting member adapted to be secured in a fixed position, the mounting member having at an end thereof a generally cylindrical end surface generated about a first axis;

a second mounting member having a first generally cylindrical end surface slidably engageable in a mating relationship with, and substantially conforming to, the end surface of the first mounting member, the second mounting member having a second generally cylindrical end surface generated about a second axis substantially perpendicular to the first axis, the first and second axes intersecting each other;

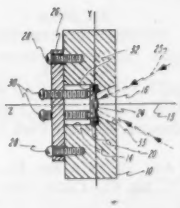
a third mounting member having a generally cylindrical end surface slidably engageable in a mating relationship with, and substantially conforming to, the second end surface of the second mounting member whereby each of said mounting members is slidably adjustable with respect to the adjacent mounting member along the engaged cylindrical surfaces; and

means for supporting the optical element on the third mounting member with its axis perpendicular to and intersecting said first and second axes so that the axis of the optical element can be aligned in a first plane by effecting relative movement between said first and second mounting members and the optical element can be aligned in a second plane perpendicular to said first plane by effecting relative movement between said second and third mounting members.

4,066,342
MIRROR MOUNT WITH BEVELED APERTURE FOR OPTICAL SYSTEMS

Thomas Clark Arends, and Warren Hastings Miller, Jr., both of Palm Bay, Fla., assignors to Harris Corporation, Cleveland, Ohio

Filed Apr. 26, 1976, Ser. No. 680,394
Int. Cl.[2] G02B *5/08*
U.S. Cl. 350—288 **1 Claim**



1. A mirror mounting arrangement comprising:

a base formed with a tubular shaped aperture extending therethrough, the base being formed with a circular shaped aperture having two sections of different diameter, the sections being substantially aligned along the axis of the aperture;

abutment means extending from the inner walls of said aperture toward the axis of the aperture to provide a passage of reduced size located along a portion of said aperture;

a mirror positioned in said aperture with its reflective side located transverse the axis of said aperture and facing said abutment means;

resilient means comprising a ring shaped wavy washer positioned between said mirror and said abutment means for providing a resilient force therebetween, said washer being formed with an opening extending therethrough to provide a path for radiation to and from said mirror through said aperture,

adjustment means for urging said mirror against said resilient means adapted to adjust the position of said mirror in a translational direction along the axis of the aperture and in a pivotal direction about the axis, said adjustment means including three screws arranged in a triangular configuration and having ends which directly contact the side of the mirror opposite said reflective side; and

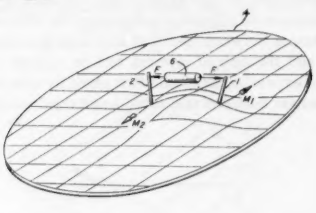
the section of said aperture in the base opposite to the section into which said mirror is disposed being bevel shaped and having a greater diameter at one end than at the end defined by the abutment means so that the path of radiation for impinging the reflective side of the mirror may form a large angle with respect to the axis of the aperture.

4,066,343

CONFIGURATION CONTROL APPARATUS

Roderic M. Scott, Stamford, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Apr. 15, 1976, Ser. No. 677,219
Int. Cl.[2] G02B 5/10
U.S. Cl. 350—295 **6 Claims**



1. Apparatus for controlled multiple mode distortion of an electromagnetic radiation element, comprising:

at least three posts affixed to the electromagnetic radiation element and extending therefrom; and

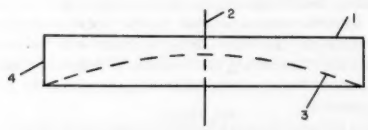
actuators disposed between said posts for applying variable force therebetween, equal and opposite moments being developed from the force of each said actuator through said posts to distort the electromagnetic radiation element, said posts being located on the electromagnetic radiation element to provide at least two modes of distortion therein.

4,066,344

LIGHT-WEIGHT ARCH TYPE STRUCTURES FOR LARGE REFLECTIVE MIRRORS

Dipak Chandra Talapatra, 6611 Elk Park Court, Alexandria, Va. 22310

Filed Aug. 30, 1976, Ser. No. 718,547
Int. Cl.[2] G02B 5/08
U.S. Cl. 350—310 **3 Claims**



1. A light-weight mirror structure consisting of a single solid cylindrical block having a reflecting face and a support face opposite the reflecting face, said support face being in the form of a structural arch with its apex coincident with the axis of rotation of the cylindrical block.

4,066,345

SOUND-FILM CAMERA

Otto Freudenschuss; Otto Kantner, and Peter Revy von Belvard, all of Vienna, Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Continuation-in-part of Ser. No. 460,136, April 11, 1974, abandoned. This application Mar. 22, 1976, Ser. No. 669,110
Claims priority, application Austria, May 24, 1973, 4565/73; June 14, 1973, 5263/73
Int. Cl.[2] G03B 31/02
U.S. Cl. 352—27 **13 Claims**

1. In a cine camera, in combination:

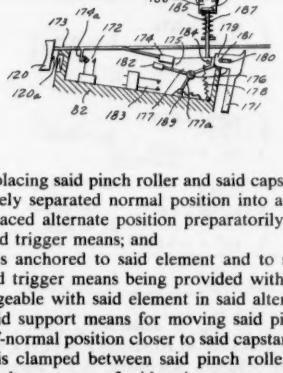
a casing adapted to accommodate a motion-picture film having a sound track, said casing being provided with an exposure gate and sound-recording means;

drive means in said casing for transporting said film past said exposure gate and said sound-recording means, said drive means including a continuously rotatable capstan and a pinch roller adapted to clamp said film therebetween;

energizing means for said drive means including manually operable trigger means;

support means for displacing said pinch roller relatively to said capstan, said support means including a movable element connected with said pinch roller by a lost-motion coupling;

an external actuating member on an outer surface of said casing coupled with said support means and manually operable independently of said trigger means for relatively displacing said pinch roller and said capstan from a more widely separated normal position into a relatively closely spaced alternate position preparatorily to operation of said trigger means; and



spring means anchored to said element and to said pinch roller, said trigger means being provided with an extension engageable with said element in said alternate position of said support means for moving said pinch roller into an off-normal position closer to said capstan whereby said film is clamped between said pinch roller and said capstan under pressure of said spring means.

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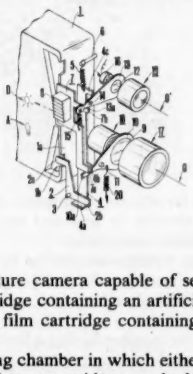
MOTION PICTURE CAMERA WITH A BUILT IN COLOR CONVERSION FILTER

Masamichi Toyama; Tomoshi Takigawa, both of Macida; Noritsugu Hirata, and Kazuo Ishikawa, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1976, Ser. No. 678,685
Claims priority, application Japan, Apr. 25, 1975, 50-50476
Int. Cl.[2] G03B 23/02
U.S. Cl. 352—72 **10 Claims**



1. A motion picture camera capable of selectively using a first type film cartridge containing an artificial light type film and a second type film cartridge containing a daylight type film, comprising:

a cartridge loading chamber in which either of the first type and the second type cartridges can be loaded;

a filter means for adapting the artificial light type film to the photography in daylight, said filter means being shiftable between a first position inserted into the photographic optical path of the camera and a second position removed from the photographic optical path by changing over operation;

an exposure device for determining the exposure value of the film;

an adjusting means for adjusting the sensitivity of the exposure device, said adjusting means being changeable between a first state in which the adjusting means adjusts the sensitivity of the exposure device for daylight photography with the artificial light type film and a second state in which the adjusting means adjusts the sensitivity of the exposure device for the artificial light photography with the artificial light type film by changing over operation;

an operation means manually operable from outside of the camera for changing over the filter means and the adjusting means, said operation means being operatively associated with the filter means and the adjusting means;

a detecting means for detecting the kind of film contained in the film cartridge loaded into the film cartridge loading chamber, said detecting means being operatively engageable with the film cartridge loaded into the film cartridge loading chamber and setting the filter means to the second position only when the film cartridge loaded into the film cartridge loading chamber is of the second type; and

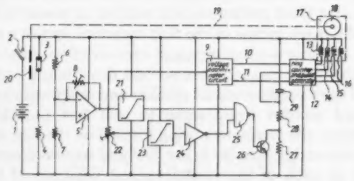
a holding means for holding the adjusting means in the first state, said holding means being operatively associated with the detecting means and setting the adjusting means compulsorily to the first state when the detecting means detects the second type film cartridge, whereby when the daylight type film is used, the operation means is made ineffective and the sensitivity setting of the exposure device is compulsorily adjusted to be suitable for daylight photography with the artificial light type film.

4,066,347

MOTION PICTURE CAMERA WITH VARIABLE APERTURE CONTROL RATE

Eduard Wagensonner, Aschheim, Germany, assignor to AGFA-Gevaert, AG, Leverkusen, Germany

Filed Dec. 10, 1975, Ser. No. 639,375
Claims priority, application Germany, Dec. 20, 1974, 2460675
Int. Cl.[2] G03B *7/08*
U.S. Cl. 352—141 **8 Claims**



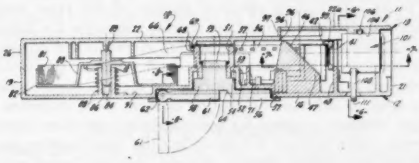
1. In a motion picture camera having film, a diaphragm having an adjustable aperture for controlling the quantity of light falling on said film, and aperture control means for changing the size of said aperture when the quantity of light falling on said film differs from a desired quantity, said aperture control means including a stepmotor and pulse generator means connected to said stepmotor for furnishing pulses energizing said stepmotor, whereby the rate of change of the size of said aperture with respect to time varies as a function of the repetition rate of the pulses supplied to said stepmotor means by said pulse generator means, the improvement comprising frequency varying means connected to said pulse generator means for varying said repetition rate of said pulses as a function of the difference between said actual quantity of light falling on said film and said desired quantity and in such a manner that said pulse repetition rate decreases in response to decreasing differences between said actual and desired quantities of light falling on said film, wherein said aperture control means comprise photosensitive receiver means positioned to receive light indicative of the quantity of light falling on said film, for furnishing an electrical light signal corresponding thereto, balanceable circuit means connected to said photosensitive receiver means for furnishing an aperture control signal having a reference amplitude when said quantity of light falling on said photosensitive receiver means corresponds to said desired light quantity and varying from said reference amplitude in a first or second direction when said electrical light signal is indicative of a quantity of light falling on said film greater than and less than said desired light quantity respectively; and wherein said frequency varying means comprises means for changing said pulse repetition rate of said pulse generator means from a first to a second pulse repetition rate when the amplitude of said aperture control signal varies from said reference amplitude by a predetermined amplitude difference in said first or said second direction, wherein said frequency varying means comprises first and second threshold circuit means connected to said balanceable circuit means for furnishing, respectively, a first and second threshold output signal when the amplitude of said aperture control signal differs from said reference amplitude by a difference exceeding said predetermined difference in said first and second direction respectively, gating circuit means connected to said first and second threshold circuit means for furnishing a gating output signal in response to said first or said second threshold output signal; wherein said pulse generator means includes timing circuit means including a plurality of timing circuit elements for determining said pulse repetition rate of said pulse generator means; and wherein said frequency varying means further comprises switching circuit means connected between said gating circuit means and said timing circuit means for changing the number of elements in said timing circuit means in response to said gating output signal.

4,066,348

CARTRIDGE VIEWER

Werner W. Ciupke, Burlingame, Calif., assignor to Montron Corporation, Mountain View, Calif.

Filed May 16, 1975, Ser. No. 578,107
Int. Cl.[2] G03B *21/00*
U.S. Cl. 352—129 **1 Claim**



1. In a cartridge viewer, means forming a framework with indexing means carried thereby, the indexing means having an aperture therein and a pair of spaced apart index projections disposed on opposite sides of the aperture, an endless length of film having perforations along one edge of the same, guide means disposed within the framework for guiding the film over the indexing means and past the aperture, a sprocket carried by the framework and engaging the film, a drive member rotatably mounted upon the framework and connected to the sprocket for driving the sprocket and advancing the film past the aperture in forward and reverse directions, crank means carried by the drive member accessible from the exterior of the framework for rotating the drive member at the same speed in forward and reverse directions, a spool rotatably mounted in the framework, a portion of the length of film being formed as a roll and being disposed in the spool with the spool being formed so that the film can be payed out continuously either from the inside of the roll or the outside of the roll, optical means carried by the framework for viewing the portion of the film in the aperture, said framework being formed with an eyepiece which can be placed against the eye for viewing of the image provided by the optical means and means provided within the framework for receiving light exterior of the cartridge viewer and for directing light through the portion of the film in the aperture so that the portion of the film in the aperture is visible to the viewer through the optical means, said framework being in the form of a case having generally planar

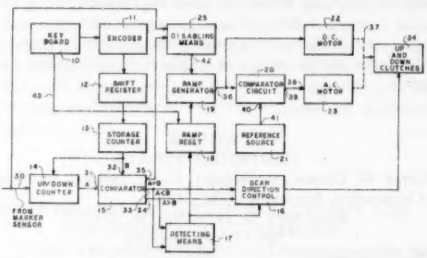
spaced parallel side walls and generally planar spaced parallel top and bottom walls, said crank means including a circular disc-like member recessed within one of said side walls so that its outer surface is generally flush with that of the side wall, said disc-like member being provided with a recess, a handle having spaced parallel planar sides, cooperative means carried by the handle and the disc-like drive member for connecting the handle to the drive member and permitting pivotal and rotational movement of the handle with respect to the drive member, said handle being movable to a position in said recess when it is not in use so that one of the spaced parallel planar sides of the handle is generally flush with the outer surface of the disc-like member.

4,066,349

INFORMATION RETRIEVAL SYSTEM HAVING RAMP MOTOR CONTROL

John R. Flint, Barrington, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Oct. 1, 1976, Ser. No. 728,674
Int. Cl.[2] G06F *13/04*; B65H *23/18*
U.S. Cl. 353—25 **9 Claims**



1. In an information retrieval system of the type which locates preselected information bearing elements for inspection, wherein the information bearing elements are consecutively numbered for identification and wherein the system includes a storage means for storing the identification number of the selected information bearing element to be inspected as a target number, a sensor for sensing the information bearing elements, and a counter for providing the identification number of the information bearing element currently being sensed as a current number, a new and improved scanning means for locating a preselected information bearing element comprising:

a comparator coupled to the storage means and to the counter for comparing the current number to the target number and for providing responsive to said comparison a first signal when the target number is greater than the current number, and a second signal when the target number is less than the current number;

drive means for driving said information bearing elements;

drive direction control means coupled to said comparator and to said drive means for causing said drive means to drive the information bearing elements in the first direction responsive to said first signal and in the second direction responsive to said second signal;

a ramp generator for providing a ramp voltage;

said drive means being coupled to said ramp generator for driving said information bearing elements at a rate substantially proportional to said ramp voltage;

detecting means coupled to said comparator and responsive to a change in the levels of said first and second signals for providing a control signal;

ramp generator reset means coupled to said detecting means and to said ramp generator for resetting said ramp generator responsive to said control signal; and

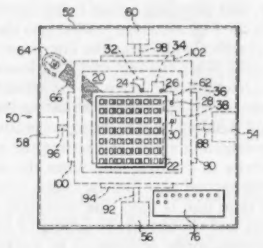
disabling means coupled to the sensor for detecting when the preselected information element is aligned with said sensor for a predetermined period of time to thereby detect when said preselected information bearing element has been located and for disabling said ramp generator responsive to such detection.

4,066,350

CHARACTER DISPLAY AND INPUT DEVICE

Hiroshi Koide; Katsuhiko Iida; Hisanori Ataka, and Taisaburo Homae, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sept. 8, 1975, Ser. No. 611,577
Claims priority, application Japan, Sept. 9, 1974, 49-103579
Int. Cl.[2] G03B *23/08, 21/14*
U.S. Cl. 353—27 R **17 Claims**



1. A character display system comprising:

film means on which characters are formed, the characters being divided into a first predetermined number of classes, each class including a maximum of a second predetermined number of the characters;

mask means formed with apertures in a number equal to said second predetermined number;

drive means comprising first and second bi-directional drivers for producing relative movement in first and second mutually perpendicular directions between the film means and mask means to position the film means in a selected one of a third predetermined number of positions relative to the mask means in the first direction and in a selected one of a fourth predetermined number of positions relative to the mask means in the second direction, a product of said third predetermined number and said fourth predetermined number being equal to said first predetermined number, the characters being formed on the film means in an alternating manner in the first and second directions so that at each of the predetermined positions of the film means relative to the mask means the characters of a selected class formed on the film means are aligned with the respective apertures of the mask means for display therethrough;

the film means being further formed with a plurality of stripes extending in the second direction in a number corresponding to said third predetermined number and with a plurality of second stripes extending in the first direction in a number corresponding to said fourth predetermined number:

the drive means comprising:

first sensor means operatively disposed to sense alignment of any one of the first stripes therewith and produce a first electrical signal in response thereto;

second sensor means operatively disposed to sense alignment of any one of the second stripes therewith and produce a second electrical signal in response thereto;

the first bi-directional driver producing relative movement between the film means and mask means in and opposite to the first direction and the second bi-directional driver producing relative movement between the film means and mask means in and opposite to the second direction to an initial position;

class selection means for inputting a code designating the selected class of characters;

computing means for counting the first and second electrical signals produces by the first and second sensors upon relative movement between the film means and mask means from the initial position in the first and second directions and stopping the relative movement when counts of the first and second electrical signals respectively correspond to the code; and

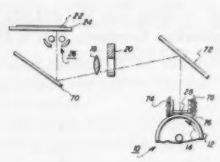
third and fourth sensor means, the film means being formed with first and second portions which are spaced in such a manner as to be out of alignment with the third and fourth sensor means respectively only when the film means and mask means are in the initial position, the computing means being responsive to the third and fourth sensor means and operative to control the first and second bi-directional drivers to produce relative movement between the film means and mask means opposite to the first and second directions until the third and fourth sensors sense that the first and second portions are out of alignment therewith and subsequently control the first and second bi-directional drivers to produce relative movement between the film means and mask means in the first and second directions respectively.

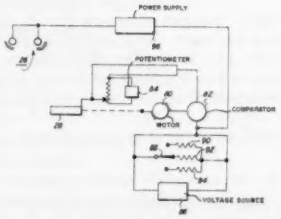
4,066,351

VARIABLE ILLUMINATION OPTICAL SYSTEM

Wayne L. Kidd, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 20, 1976, Ser. No. 659,620
Int. Cl.² G03G *15/01*; G03B *27/76*
U.S. Cl. 355—3 R **4 Claims**





1. An electrophotographic printing machine for reproducing an original document, including:

a photoconductive member;

means for charging at least a portion of said photoconductive member to a substantially uniform level;

a screen member;

means for adjusting the spacing between said screen member and said photoconductive member;

a light source for illuminating the original document;

a power supply coupled to said light source and applying an excitation voltage thereto;

means, responsive to the spacing between said scren member and said photoconductive member, for controlling said power supply to regulate the voltage applied to said light source by said power supply, thereby controlling the intensity of illuminating developed by said light source;

a lens is a light receiving relationship with the light rays transmitted from the original document to form a light image thereof; and

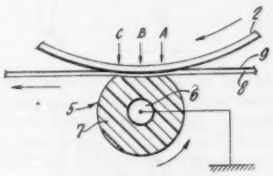
means for directing the light image onto the charged portion of said photoconductive member to record an electrostatic latent image thereon.

4,066,352

ELECTROCONDUCTIVE ELASTIC SPONE MEMBER AND ELECTROSTATIC IMAGE TRANSFER MECHANISM

Hiromi Kameda, Toyokawa, and Sanji Inagaki, Okazaki, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 515,758, Oct. 17, 1974, Pat. No. 3,978,268.
This application Apr. 19, 1976, Ser. No. 678,276
Claims priority, application Japan, Oct. 23, 1973, 48-119514; Aug. 13, 1974, 49-93129
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 TE **5 Claims**



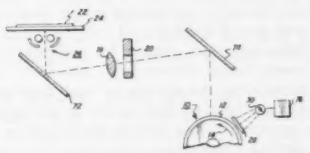
5. An electroconductive elastic sponge member in the form of a roller for use in electrophotography as an electrostatic latent image transferring means comprising an electrically conducting substrate member formed thereover with an electroconductive elastic layer which comprises an elastic polymeric foam treated and coated with an electroconductive additive agent including a mixture of a water dispersable binding resin, a fine electroconductive powder and a fluid alcohol by which said polymeric foam is expandable, said member having an electrical resistivity of 10^2 to 10^6 ohm/cm with said resistivity varying inversely with the pressure applied to said member.

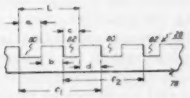
4,066,353

HALF TONE IMAGING SYSTEM

Richard M. Bobbe, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 13, 1976, Ser. No. 722,449
Int. Cl.² G03G *15/01*
U.S. Cl. 355—4 **23 Claims**





1. A half-tone screen, including:

a substantially transparent member; and

a plurality of grooves formed in said transparent member, said plurality of grooves comprising a first set of grooves and a second set of grooves with the width of each groove

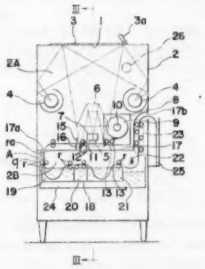
of the first set being greater than the width of each groove of the second set and said plurality of grooves being arranged in a repetitive pattern with each groove of the first set being interposed between adjacent grooves of the second set.

4,066,354

MICROFILM APPARATUS

Shunkichi Igarashi, Yokohama; Takeshi Okano, Amagasaki; Sho Takahama, Takarazuka, and Yoshio Hakamata, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed June 14, 1976, Ser. No. 695,720
Claims priority, application Japan, June 19, 1975, 50-75193
Int. Cl.[2] G03B *29/00*
U.S. Cl. 355—28 **2 Claims**



1. In a microfilm apparatus employing film which is in roll form and which includes at least one layer of a silver halide emulsion, and said apparatus includes means for exposing said film to image-wise reflected light from documents to be microfilmed and means for development processing of said exposed film, whereby microfilm copies of said documents may be obtained, the improvement wherein said apparatus comprises:

a main housing including outer walls;

partition wall means within said main housing, and acting in conjunction with the outer walls of said main housing to define an upper, exposure compartment and a lower, development processing compartment separate from said exposure compartment and to one side and below said exposure compartment;

means within said partition wall means for defining an entry opening which communicates between said exposure compartment and said development processing compartment;

means including an opening within said main housing outer wall at said development and processing compartment for defining an exit opening for said development processing compartment remote from said entry opening and communicating the interior of said development processing compartment to the exterior of said apparatus;

an exposure system within said exposure compartment including a horizontal, transparent document rest provided at the upper portion of said exposure compartment, a focussing lens system to one side of said exposure compartment overlying the upper portion of said development processing compartment, mirror means within said exposure compartment and acting in conjunction with said focussing lens system for focussing the image of a document placed on said document rest at an exposure station overlying said development processing compartment;

microfilm unit production means including drive roll means which may be alternately actuated to advance said film intermittently to bring successive film frames thereof to said exposure station whereby said successive frames are exposed to said image-wise light and cutter means located downstream of said exposure station in terms of film advance and actuable to cut said film subsequent to said continuous movement thereof, whereby the leading end portion of said film constituting an exposed microfilm unit is detached from the remainder of said film; and

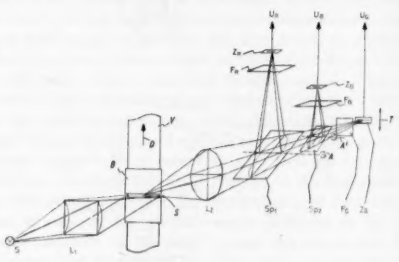
development processing means provided in said development processing compartment and including at least one bath containing developer solution, rinsing means and drying means, and film forwarding means for moving successively detached microfilm units through said entry opening and through said development processing compartment whereby said film units may be processed by said development processing means, and for moving said processed microfilm units through said exit opening to the exterior of said apparatus with said development processing compartment constituting a compact and easily accessible unit separate from and to one side of said exposure compartment.

4,066,355

SOLID-STATE COLOR-COPYING SCANNER

Josef Helmberger, Munich, and Klaus Stadler, Irschenhausen, both of Germany, assignors to AGFA-Gevaert, AG, Leverkusen, Germany

Filed Apr. 7, 1976, Ser. No. 674,632
Claims priority, application Germany, Apr. 9, 1975, 2515501
Int. Cl.[2] G03B *27/78*
U.S. Cl. 355—38 **10 Claims**



1. A copying method comprising the steps of:

displacing an original in a direction past a scanning location;

irradiating on said original at said location an entire strip extending transverse to said direction continuously for a predetermined time period;

optically deriving during said time period a plurality of different color-component strips each corresponding to a respective color component of the irradiated strip;

reflecting each of said color-component strips with a respective mirror during said time period to a respective transducer and simultaneously converting said color-component strips therewith into respective multiplicities of signals each corresponding to a respective section of the respective color-component strip;

pivoting at least some of said mirrors about axes parallel to said original at said irradiated strip for focussing said mirrors on said irradiated strip;

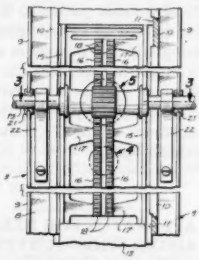
storing up during said time period each of said multiplicities of signals; and

feeding after said time period each of the stored-up multiplicities of signals to respective scribers.

4,066,356
ANTI-BACKLASH MEANS FOR ADJUSTING ENLARGERS

John C. Parker, Los Angeles, Calif., assignor to Vivitar Corporation, Santa Monica, Calif.

Filed Oct. 7, 1976, Ser. No. 730,375
Int. Cl.[2] G03B 27/52; F16B 55/18
U.S. Cl. 355—63 6 Claims



1. A rack and gear drive, comprising:
a. an essentially planar carrier frame including opposed side margins, a pair of adjacent parallel disposed rack elements, and yieldable elements integrally connecting each rack element to a corresponding side margin to permit limited movement of each rack element in a direction essentially perpendicular to the carrier frame;
b. a supporting means receiving the side margins of the carrier frame for longitudinal movement of the rack elements;
c. a drive shaft carried by the supporting means;
d. and gear means carried by the shaft for engagement with the rack elements.

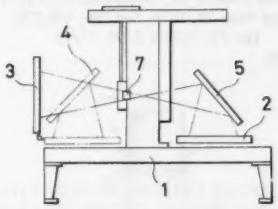
3. An anti-backlash means, comprising:
a. a supporting means having opposed guide flanges;
b. a carrier frame defining a plane and including side margins fitting the guide flanges for longitudinal movement relative to the supporting means;
c. a pair of rack elements disposed longitudinally in the central region of the carrier frame and a plurality of yieldable elements connecting each rack element to a corresponding side of the carrier frame to permit limited displacement with respect to the plane defined by the carrier frame;
d. a drive shaft disposed over the carrier frame in transverse relation thereto;
e. a gear having portions forming a pair of drive gear elements mounted on the shaft and engagable with the racks;
f. one pair of said elements having teeth offset a preselected amount and arranged, when yieldably pressed between the teeth of said other pair of elements, to compensate for backlash;
g. a pair of tracks disposed longitudinally at opposite sides of the carrier frame;
h. and a pair of wheels carried by the shaft, the wheels having a diameter corresponding to the pitch diameter of the gear elements to limit intermeshing of the gear and rack elements.

4,066,357
PROCESS CAMERA

Yutaka Mori, 1-15-5 Zoshigaya, Toshima, Tokyo 171, Japan

Filed June 23, 1976, Ser. No. 699,166
Claims priority, application Japan, June 24, 1975, 50-77711; June 24, 1975, 50-77712; June 24, 1975, 50-77713
Int. Cl.[2] G03B 27/70
U.S. Cl. 355—66 3 Claims

1. A process camera comrising:
a base;
a film mounting plate attached to said base;
a manuscript mounting plate attached to said base and in a common plane with said film mounting plate;
means for rotating one of said plates with respect to said plane from a first position in said plane to a second position out of said plane;
lens means having an optical path parallel to, and spaced from, said plane;

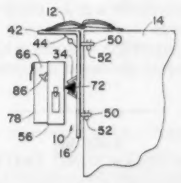


first reflective means for bending the optical path from the other of said plates through said lens means; and
second reflective means for bending the optical path from said one plate in said first position through said lens, said second reflective means being movable out of the optical path of said lens;
whereby said one plate in said second position is in said optical path of said lens.

4,066,358
PHOTOCOPY MACHINE

Arzella F. Stevenson, 50 Oswego Place, North Babylon, N.Y. 11703

Filed July 19, 1976, Ser. No. 706,159
Int. Cl.[2] A47B 27/04; G03B 27/62
U.S. Cl. 355—75 5 Claims



1. An attachment device for a book copier adapted to be removably received on said copier comprising:
a substantially rectangular support frame having a pair of opposed sides joined by a spaced top and base member,
a platform,
hinge means for pivotably joining said platform to the top member of said support frame, said hinge means including
means for locking said platform in a substantially perpendicular position relative to said support frame to hold and support a book to be copied,
a slot formed in the opposed sides of said support frame,
an elongated bar member spanning the distance between said sides of said support frame and having an opposed end slidably mounted within each of said slots,
means on said bar member cooperating with said sides of said support frame for retaining said bar member in a vertically adjusted position in said slots,
mounting means extending rearwardly from one surface of each of said sides of said support frame for attaching said support frame to a book copier,
dove-tail slot means formed in said bar member opening in a forward direction opposed to the direction of extension of said mounting means,
a paper holder receptacle having an open top adapted to receive copy paper therein, and

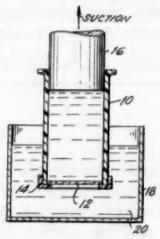
a dove-tailed shaped bar element secured to a rear wall of said receptacle removably received within the dove-tail slot means in said bar member.

4,066,359

METHOD AND STRUCTURE FOR TREATING BODY FLUIDS WITH CELLS THEREIN

Louis Bucalo, 155 Roberts St., Holbrook, N.Y. 11741

Filed May 21, 1976, Ser. No. 688,728
Int. Cl.[2] G01N *1/00, 33/16*
U.S. Cl. 356—36 **12 Claims**



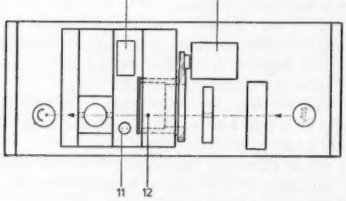
1. In a method for preparing for subsequent analysis cells of the type encountered in the body of a living being, such as tissue cells, blood cells, marrow cells and the like or cells of microorganisms such as bacteria, fungi, or the like, the steps of placing in a cylinder carrying a filter a sample in the form of a fluid which has therein cells which are to be analyzed, then carrying out supply and discharge cycles with respect to the interior of the cylinder and while carrying out a supply cycle directing into the interior of the cylinder a treating liquid which when entering the cylinder contacts the sample for at least partly contributing toward placing the cells which are to be subsequently analyzed in a given condition, and while carrying out a discharge cycle discharging the treating liquid through the filter out of the cylinder while also discharging with the treating liquid undesired components from the sample.

4,066,360

DEVICE FOR MEASURING AND RECORDING SPONTANEOUS BLOOD PLATELET AGGREGATION IN PLATELET-RICH CITRATED PLASMA

Klaus Breddin, Walldorf, and Wolfgang Schremmer, Obermelsungen, both of Germany, assignors to B. Braun Melsungen Aktiengesellschaft, Melsungen, Germany

Filed Feb. 19, 1975, Ser. No. 550,920
Claims priority, application Germany, Feb. 21, 1974, 2408214
Int. Cl.[2] G01N *33/16;* **B01L** *9/06*
U.S. Cl. 356—39 **12 Claims**



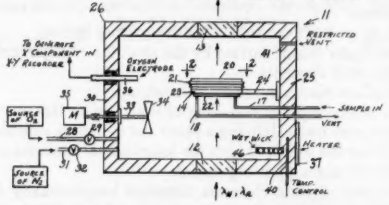
1. A device for the photometric measuring of the spontaneous aggregation of blood platelets in blood platelet rich citrated plasma, comprising a photometer including a light source and a photo cell aligned with the light source to receive light rays therefrom, a light filter positioned between the light source and photo cell, a diaphragm having an aperture formed therein in a predetermined position and located between said filter and photo cell whereby the aperture in the diaphragm passes a well defined column of light rays from the light source to the photo cell; a hollow disc cuvette rotatably mounted in the photometer between said diaphragm and photocell for rotation in a vertical plane with its central axis in a horizontal plane, said vertical plane being located in and transverse to the path of light rays passing through the diaphragm, said cuvette containing a supply of citrated plasma to be measured; means for heating said disc cuvette to a predetermined temperature; and means for rotating said disc cuvette at a speed of between 10 and 60 revolutions per minute; said disc cuvette being located in the photometer at a position with respect to said diaphragm wherein the light rays from the diaphragm pass through a lower quadrant of the disc cuvette with the disc viewed facing the diaphragm.

4,066,361

METHOD AND APPARATUS FOR DERIVING OXYGEN ASSOCIATION CURVES

Eugene K. Achter, Gaithersburg, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 504,112, Sept. 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 446,089, May 1, 1974, abandoned. This application Mar. 19, 1976, Ser. No. 668,548
Int. Cl.[2] G01N *33/16, 21/16, 21/22*
U.S. Cl. 356—41 **19 Claims**



1. An assembly for use in a photometer for measuring oxygen association curves, comprising a chamber, means for transmitting a measuring light beam through the chamber, light-transmitting cell means in the chamber formed to support sample material in the chamber transverse to the optical path of the measuring light beam in the form of a thin flat layer, a source of deoxygenating gas, controlled conduit means connecting said deoxygenating gas source to said chamber, a source of oxygen, controlled conduit means connecting said oxygen source to said chamber, said cell means comprising a light-transmitting body and a gas-permeable light transmissive membrane placed on the body over the sample supported thereon, and oxygen-sensing means mounted in said chamber.

4,066,362

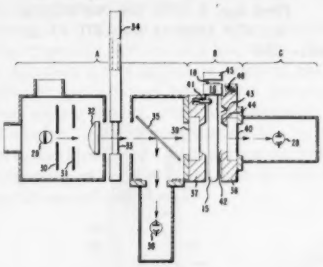
APPARATUS AND METHOD FOR PERFORMING PHOTOMETRIC ANALYSIS

Eibert P. Carter, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 16, 1968, Ser. No. 753,200
Int. Cl.[2] G01N *33/16, 21/24*
U.S. Cl. 356—180 **14 Claims**

1. An apparatus for performing photometric analysis on a sample fluid contained in a deformable container, comprising: an irradiating means, said deformable container being transparent to the radiation from said irradiating means; a cell-forming means adapted to form said deformable container into a sample cell with a predetermined cell length, said cell-forming means

comprising a sealing means adapted to squeeze the majority of said sample fluid into a region of said deformable container and



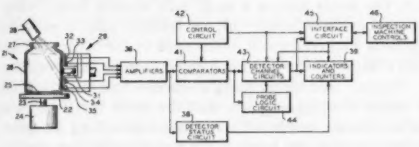
to seal off that region to form a closed test pouch; and a radiation detection means adapted to measure the radiation transmitted through said sample cell.

4,066,363

APPARATUS AND METHOD FOR INSPECTING GLASS CONTAINERS

John W. Juvinall, Ottawa Lake, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sept. 8, 1976, Ser. No. 721,412
Int. Cl.² G01N *21/32*
U.S. Cl. 356—198 **39 Claims**



1. In an inspection apparatus including an inspection station for rotating a glass container about its longitudinal axis, a light source for illuminating the interior of the glass container, a detector assembly mounted adjacent the side wall of the container and having light responsive means spaced apart along a line substantially parallel to the longitudinal axis of the container for generating at lease two input signals with a characteristic proportional to the amount of light transmitted through the side wall from the light source and a detection circuit for monitoring the input signals and for generating an output signal in response to a predetermined change in the light proportional characteristic of the input signals, the output signal representing the detection of a predetermined type of defect, the detection circuit comprising:

amplifier means responsive to the input signals for generating amplified signals having a first signal component representing the average light proportional characteristic of the input signal generated by the transmission of the light through an unobstructed side wall of the container and a second signal component representing the percentage deviation from the average characteristic generated by the transmission of light through an obstruction in the side wall of the container;

filter means responsive to said amplified signals for separating each of said first signal components from said associated second signal component;

comparison means for generating a reference signal, for comparing the light proportional characteristic of each of said separated second signal components with said reference signal and for generating a detection signal for each of said separated second signal components having a light proportional characteristic exceeding the magnitude of said reference signal; and

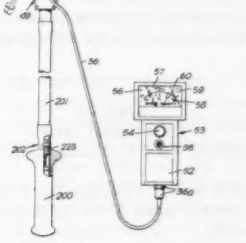
logic circuit means including timing means responsive to said detection signals for generating a signal having a duration representing a predetermined amount of rotation of the container after a first one of said detection signals is received, said logic circuit means being responsive to said detection signals and said timing means signal for generating the output signal in response to the receipt of a least one of said detection signals during the duration of said timing means signal.

4,066,364

APPARATUS FOR MEASURING SMOKE DENSITY

Reginald Stanley Emerson, Buckingham, England, assignor to Leslie Hartridge Limited, England

Filed Apr. 26, 1976, Ser. No. 680,084
Claims priority, application United Kingdom, Apr. 29, 1975, 17848/75
Int. Cl.² G01N *21/26*
U.S. Cl. 356—207 **14 Claims**

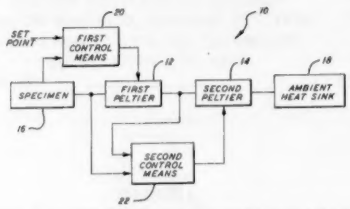


1. Apparatus for measuring smoke density comprising a probe for insertion into an exhaust gas pipe, a tube connected to the probe for the passage, through the tube, of smoke collected by the probe, a waisted portion of reduced diameter in the tube, plug means located concentrically within the tube to form therewith an annular venturi the throat of which lies at the said waisted portion of the tube, a plurality of holes in the waisted portion of the tube, a light source arranged outside the tube in the vicinity of the waisted portion thereof to pass a light beam along a first straight path into the tube through a first one of said holes in the waisted portion of the tube, transversely through the throat of the venturi, and then out of the tube through a second one of said holes in the waisted portion of the tube, at least one light-reflecting surface arranged outside the tube in the vicinity of the waisted portion thereof to receive the light beam after it has passed out of the tube and to reflect the light beam back into the tube along another straight path which does not coincide with any earlier path of the beam and through a corresponding one of the holes in the waisted portion of the tube, transversely through the throat of the venturi, and then out of the tube through yet another one of the holes in the waisted portion of the tube, a photo-electric cell positioned outside the tube in the vicinity of the waisted portion of the tube to receive the reflected light beam after it has passed out of the tube through a respective one of said holes, and visible display means connected to said photo-electric cell to receive an electrical signal therefrom whereby a visible display is given of the smoke density measured by the apparatus.

4,066,365
TEMPERATURE CONTROL APPARATUS

John J. J. Staunton, Oak Park, Ill., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 28, 1976, Ser. No. 690,891
Int. Cl.[2] G01N *21/16;* F25B *21/02*
U.S. Cl. 356—244 9 Claims



1. Apparatus for controlling the temperature of a specimen, comprising:

a first Peltier unit having first and second thermal junctions, said first thermal junction thereof being interfaced with the specimen;

a second Peltier unit having first and second thermal junctions, said first thermal junction thereof being interfaced with said second thermal junction of said first Peltier, said second thermal junction thereof being interfaced with an ambient heat sink;

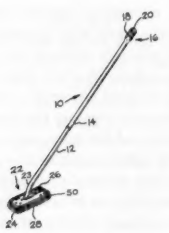
means for controlling the power to said first Peltier unit in proportion to the temperature differential between the specimen and a set point; and

means for controlling the power to said second Peltier in proportion to the temperature differential across said first Peltier.

4,066,366
CAR WASH MOP

Donald F. Reynolds, 4415 E. Textile Road, Ypsilanti, Mich. 48197

Filed Sept. 7, 1976, Ser. No. 720,953
Int. Cl.[2] A46B *11/04;* A47L *13/22*
U.S. Cl. 401—285 10 Claims

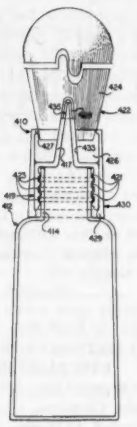


1. A car wash mop comprising an elongated handle open at one end for connection to a source of liquid and having for its other end a transverse member open at laterally extending ends, said handle being hollow so as to define a passageway for liquid extending from said one end to said other end for discharge through said laterally extending ends, a tubular frame assembly having ends pivotally connected to said laterally extending ends for pivotal movement relative to the handle and so as to be in communication with said passageway, said tubular frame assembly having a plurality of apertures for discharge of liquid flowing from said passageway, and a flexible mop head fitted over said tubular frame assembly, said tubular frame assembly including a frame member having a generally eight-shaped configuration, and said ends of the frame assembly are at the midportion of the generally eight-shaped configuration in endwise facing relationship.

4,066,367
BRUSH SHAVE DEVICE

Frank Sherosky, 29101 Hayes, Warren, Mich. 48093

Filed Apr. 5, 1976, Ser. No. 673,466
Int. Cl.[2] A46B *11/04;* A47L *13/22*
U.S. Cl. 401—286 1 Claim



1. Improvement in a brush shave device for dispensing liquid shaving soap from a bottle having a shaving brush carried theron, the bottle having a neck, said shaving brush being of the type having a single tuft of bristles, said improvement comprising a tapered spout on the neck of the bottle, said spout having a flat platform portion formed thereon, has been added after "bottle," said bottle being a squeeze type bottle and filled with liquid shaving soap, so that the same sprays from said spout to saturate said bristles, means for attaching the spout to the bottle so that said spout is not removeable from said neck and so that the bottle is not re-fillable, the brush having an adhesive base in which said tuft of bristles is embedded, said adhesive base being a solid body and having some height thereto so as to have a tapered aperture therein for sealing against the taper on said spout, a joining member surrounding the adhesive base so that the tuft of bristles projects out of the upper end of said joining member, said joining member having a flange on its upper end which is smaller in diameter than that of said adhesive base and engages the upper end of said adhesive base, means on the lower end of said joining member for removeably connecting the same to the bottle, the upper end said spout projecting above said adhesive base and into the bristles less than half the height thereof, the bottom of said adhesive base bottoming directly upon the platform portion of said spout when the brush is inserted and held on said bottle, said attaching means for the spout constructed so that said spout remains affixed to the bottle when the joining member is removed for removing the brush, and a cap for said spout for sealing the bottle when the device is being transported.

4,066,368
HELICAL ROD DEADEND HAVING SEGMENTED ROD RECEIVING CONNECTOR

Henry N. Mastalski; James P. Lucas; Edward Dziedzic, and David P. Eppinger, all of Centralia, Mo., assignors to A. B. Chance Company, Centralia, Mo.

Filed Aug. 5, 1975, Ser. No. 602,064
Int. Cl.[2] F16G *11/04*
U.S. Cl. 403—211 4 Claims

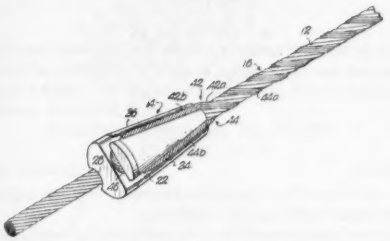
1. Deadending apparatus for an elongated line or the like, including:

an elongated, unitary, uniformly tapered block having structure defining three circumferentially spaced, peripheral grooves extending along the length of the block,

one of said grooves being configured for receiving a segment of said line adjacent the end thereof with a portion of the line extending radially outwardly beyond the adjacent outermost surfaces of the block,

the remaining two of said grooves being configured for receiving respective portions of a line tie;

a line tie including a first section in gripping engagement with said line, and a second loop section free of said line, said loop section having respective elongated portions thereof received within corresponding line-tie receiving grooves of said block with a bight portion interconnecting said elongated portions and in engagement with the largest diameter end of said block,



said line tie-receiving grooves being dimensioned such that said elongated portions are seated within the same without extending radially outwardly beyond the outer adjacent surfaces of said block; and

a socket having structure defining a tapered bore therein for complementally receiving said block, the loop segment of said line tie positioned therearound, and the segment of said line received by said one groove,

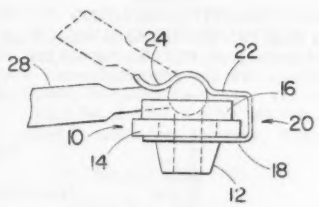
said socket and block cooperatively engaging said line, with the line tie portions seated within said remaining grooves being substantially free of pressing engagement between said socket and block.

4,066,369

OVERRIDE CLIP ASSEMBLY

Reginald D. Furtah, Livonia, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Oct. 26, 1976, Ser. No. 735,309
Int. Cl.² F16C *11/06*
U.S. Cl. 403—115 **3 Claims**



1. A yieldable connection between an elongated driving member and an elongated driven member in which movement of the driving member in the direction of its axis causes movement of the driven member substantially along the direction of its axis;

a bushing removably seated in an aperture in said driven member, said bushing including a tapered portion situated in said aperture, a recess in the larger end of said tapered portion, the axis of said tapered portion being substantially perpendicular to the direction of movement of said driven and driving members;

a ball member on the end of said driving member, said ball member being seated in said recess; and

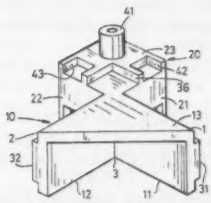
a yieldable resilient spring clip having a first leg removably attached to said bushing and a second leg biasing said ball toward said bushing.

4,066,370

ASSEMBLING PIECE

Paul Van Driessche, 88 Chemin de Thieusies, 7400 Soignies, Belgium

Filed May 17, 1976, Ser. No. 686,985
Claims priority, application Belgium, May 16, 1975, 156437
Int. Cl.² F16B *5/00*
U.S. Cl. 403—217 **8 Claims**



1. An assembling piece for forming a corner joint for a modular furniture structure, said piece comprising:

two right angle, intersecting vertical walls of cruciform configuration,

a horizontal wall integral with said vertical walls and extending on both sides of said intersection and at right angles thereto,

said vertical walls including first means for mechanically interfitting said piece with the ends of horizontal frame elements coupled to respective vertical walls and extending parallel thereto and at right angles to each other,

said intersecting vertical walls and said horizontal wall defining a corner cavity on one side of said cruciform for receiving the upper end of a vertical frame element, and

at least one of said walls at said cavity carrying a second means for mechanically interlocking the piece with the end of said vertical frame element for locking said frame element to said piece,

and wherein said horizontal wall constitutes a rigid mechanical reinforcement for said piece,

and wherein that portion of the wall which extends on the opposite side of said cruciform forms an integral support for horizontal shelving or the like.

4,066,371

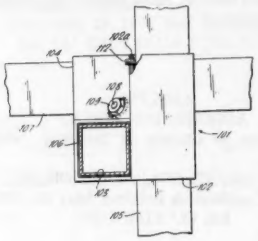
BAR JOINTING MEMBERS

Arthur J. Chapman, May Lodge, Cane End, near Reading, England

Filed Aug. 30, 1976, Ser. No. 718,533
Int. Cl.² F16B *7/04*
U.S. Cl. 403—218 **3 Claims**

1. A bar jointing member comprising a one piece housing formed to present a plurality of bores and an aperture each extending through said housing; a plurality of bars engaged in and passing through respective ones of said bores; and a tapered clamping bolt received in said aperture; said aperture communicating with each of said bore such that portions of said tapered clamping bolt engaged in said aperture extend into said bores and engage said bars to clamp said bars securely within said bores, the wall of one of said bores being formed to present a screwthreaded further aperture, which one of said borres will receive a vertical one of said bars in use, and a

screw engaged in said further aperture to be tightened onto said vertical one of said bars to retain the housing at a desired



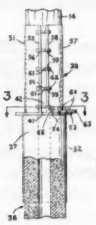
height thereon while others of said bars are engaged in the others of said bores.

4,066,372

SLOTTED FLANGE CONNECTOR USEABLE IN A METHOD FOR REPLACING AN EXISTING UTILITY POLE WITHOUT DISTURBING HARDWARE MOUNTED THEREON

Harold V. Swanson, Morris Plains, and Jorge E. Forero, Parsippany, both of N.J., assignors to Interpace Corporation, Parsippany, N.J.

Filed Apr. 5, 1976, Ser. No. 673,408
Int. Cl.² F16B *2/02*
U.S. Cl. 403—302 **6 Claims**



1. A connector for splicing axially butting ends of a first and a second pole section, said connector comprising:

a first closure plate in the form of an arc of a cylinder adapted to embrace a first of said pole sections at its said end,

a second closure plate complementary to said first closure plate and movable with respect thereto for completing a generally cylindrical assembly adapted to engage said first pole section,

closure means for moving said second closure plate between an open position wherein it is spaced from said first closure plate and said first pole section, and a closed position wherein it is adapted to engage said first pole section between itself and said first closure plate,

said second closure plate having a first terminal flange projecting radially outwardly therefrom,

a second terminal flange adapted to be secured to said second pole section adjacent said end thereof and projecting radially outwardly therefrom,

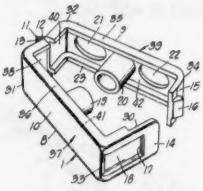
said first terminal flange being securable to said second terminal flange by means of bolts, parallel slot-shaped bolt holes in at least one of said first terminal flange and the portion of said second terminal flange adjacent thereto, having major axes disposed parallel with the direction of movement of said second closure plate from said open position to said closed position and arranged to receive said bolts, wherein said first closure plate and said second closure plate both terminate at their respective sides in vertical flanges, and further comprising closure bolts screwably engageable with said vertical flanges to serve as said closure means.

4,066,373

FASTENING DEVICE

David E. Workman, Orange, Calif., assignor to Samsonite Corporation, Denver, Colo.

Filed Aug. 4, 1976, Ser. No. 711,692
Int. Cl.² A44B *21/00*
U.S. Cl. 403—391 **5 Claims**



1. A device for releasably fastening objects together in spaced-apart relationship comprising:

a pair of complementary U-shaped gripping means hingedly connected to each other through an integral hinge, and having means for releasably interlocking said gripping means at the other end of said device include a hook on one gripping means which projects outwardly from its end portion, and a complementary opening in the opposing gripping means for releasably engaging said hook, the walls defining said opening being notched to overlap the hookbearing end portion;

each gripping means having an elongated, substantially flat outer portion and a pair of integral, relatively flat end portions formed at an angle in the range of about 15° to about 90° to said elongated substantially flat outer portion, said integral hinge being formed by outwardly protruding portions from each opposing end portion;

each said protruding portion projecting from the plane of its end portion toward the opposing protruding portion, and at an angle in the range of about 95° to about 125° with respect to the plane of its portion; and

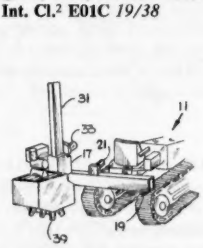
each said gripping means having at least one projection from its inner surface adapted to meet a complementary projection from the opposing inner surface.

4,066,374

TRENCH COMPACTOR

Arthur Elgin King, P.O. Box 495, Grass Valley, Calif. 95945

Filed Aug. 20, 1976, Ser. No. 716,255
Int. Cl.² E01C *19/38*
U.S. Cl. 404—117 **13 Claims**



1. A primemover mountable device for compacting dirt in an area located at the side of and parallel to the direction of movement of said prime mover or in line therewith comprising:

a. a tool bar mountable on one end of a primemover perpendicular to the direction of travel of said mover,

b. a guide rail coextensive in length to said tool bar, the length of said rail being rigidly secured thereto along the length thereof,

c. extending means, movably mounted on said guide rail and laterally extendable along said guide rail,

d. a coupling means movably mounted on said extending means and having a vertical bore therethrough for movement of a mast therein,

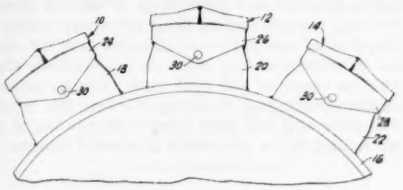
e. a mast disposed in said bore of said assembly, and vertically movable therein, and

f. a vibratory earth compacting device mounted on the lower end of said mast wherein vertical movement of the mast brings said device into operative position for compacting dirt in the area along side of said primemover.

4,066,375
REPLACEMENT CAP FOR COMPACTOR WHEEL

James O. Caron, Modesto; Fred J. Caron, Lodi, and Norman F. Cady, El Cajon, all of Calif., assignors to Caron Compactor Company, Stockton, Calif.

Filed Feb. 22, 1977, Ser. No. 770,709
Int. Cl.² E01C *19/26*
U.S. Cl. 404—121 **10 Claims**

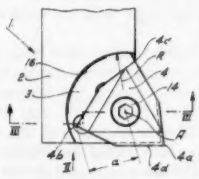


1. A replacement cap for use on the tip of a compaction wheel foot, said cap including a pair of half-caps, each half-cap comprising a body of generally rectangular shape having an outer end portion integral with an inner end portion, said inner end portion of each half-cap including upper and lower generally flat facets lying in planes extending transverse of the cap and which converge outwardly to form a wedge having an apex, and weld means for securing the half-caps to the tip and to each other with said apexes of the half-caps abutting one another intermediate the tip whereby adjacent upper facets on the half-caps diverge apart to form a V-shaped pocket for placement of weld material.

4,066,376
TURNING TOOL WITH INTERCHANGEABLE POLYGONAL CUTTING INSERT

Otto Eckle, and Hermann Stahl, both of Loechgau, Germany, assignors to Komet Stahlhalter- und Werkzeugfabrik, Robert Breuning GmbH, Besigheim, Germany

Filed Feb. 3, 1976, Ser. No. 654,760
Claims priority, application Germany, Feb. 19, 1975, 7504960[U]
Int. Cl.² B26D *1/00*
U.S. Cl. 407—101 **3 Claims**



1. In a turning tool having an interchangeable polygonally shaped cutting insert, particularly for metal machining, the improvement comprising:

a holder having a first recess therein;

an insert carrier received in said first recess and secured thereto by means of a holding screw, said insert carrier having a second recess therein for receiving said cutting insert therein;

first holding means for holding said cutting insert in said second recess, said insert carrier having a planar base face and a generally semicylindrical supporting surface extending at right-angles to said base face, said semicylindrical supporting surface extending continuously between said base face and an opposite face on said insert carrier on its edge facing away from an effective cutting point on said cutting insert, said base face and said semicylindrical supporting surface on said insert carrier being supported on correspondingly shaped counter-surfaces of said first recess, one of said counter-surfaces being a semicylindrical support surface, said insert carrier having a first threaded central hole therein for receiving said first holding means therein, the axis (A) of said semicylindrical supporting surface on said insert carrier coinciding generally with the axis (A) of said central hole, said semi-cylindrical supporting surface having a radius (R) only slightly greater than a distance (a) between said effective cutting point and said axis (A) of said central hole, said supporting surface on said insert carrier having in its central region a smaller radius portion than said radius (R), the circumferentially spaced portions of said supporting surface on said insert carrier having the larger radiused surface engaging said semicylindrically shaped counter-surface on said holder;

second holding means for holding said insert carrier to said holder in said first recess;

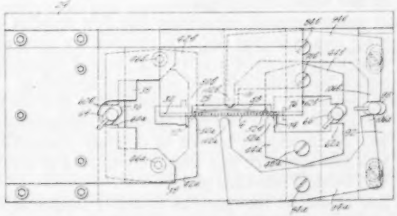
a second threaded hole in said insert carrier extending parallel to said first threaded hole and perpendicular to said base face, said first holding means comprising a first screw received in said first threaded hole, said second holding means comprising a second screw received in said second threaded hole;

said insert carrier having a fixing bore extending perpendicular to said base face and a fixing pin received in said fixing bore and a corresponding bore in said first recess, said fixing bore being provided at a point remote from said axis (A) of said semicylindrical supporting surface and at the point of intersection of two bearing faces which include an angle of somewhat less than 90°, said two bearing faces being provided opposite said effective cutting point with a third bearing face being provided adjacent an effective cutting edge.

4,066,377
TOOL ELEMENT PLACEMENT MEANS

Curtiss Gilmore Howard, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 11, 1976, Ser. No. 666,110
Int. Cl.² B23B *35/00, 39/16;* **C25D** *17/00;* **B23K** *9/16*
U.S. Cl. 408—1 R **24 Claims**



1. A device useful in establishing a plurality of tool elements

in a desired configuration in relation to a workpiece surface comprising:

a. a base;

b. a support structure;

c. a guide member having a flexible section containing guide means adapted to receive the tool elements, said member being supported in relation to the base by the support structure;

d. means for deflecting the flexible section to position the guide means in the desired configuration; and

e. a fixturing structure to hold the workpiece, said fixturing structure and support structure establishing a cooperative relationship between the flexible section and workpiece surface.

4,066,378

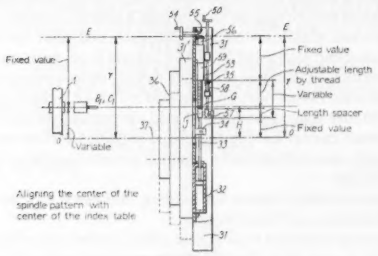
MULTI-SPINDLE DRILLING MACHINE

Toshio Saito, Shizuoka, and Tadahiko Kobayashi, Gotenba, both of Japan, assignors to Fuji Seiki Machine Works, Ltd., Japan

Filed Nov. 1, 1976, Ser. No. 737,419

Int. Cl.[2] B23B *39/18*

U.S. Cl. 408—46 **9 Claims**



1. In a multi-spindle drilling machine, comprising:

a frame;

base slide means linearly slidably supported on said frame for movement in a selected horizontal direction;

drive means connected to said base slide means for causing selective slidable displacement thereof in said horizontal direction;

a rotatable index plate supported on said slide means for rotation about a vertical axis, said index plate having an upwardly facing support surface adapted to have a workpiece mounted thereon;

head means spaced upwardly above said index plate and vertically slidably supported on said frame, said head means having support plate means defining a horizontal centerline which is parallel to said horizontal direction and intersects said vertical axis;

a pair of first tool spindles rotatably supported on said plate means and projecting toward said index plate, said first spindles defining a first reference line which extends horizontally between and intersects the rotational axes of said first spindles, said first reference line being perpendicular to said horizontal centerline;

first means movably supporting said first spindles on said plate means so that said first spindles are symmetrically supported on opposite sides of a vertical reference plane which passes through said horizontal centerline;

first means for selectively adjusting said first supporting means for causing said first spindles to be simultaneously and synchronously moved in opposite directions along said first reference line selectively toward or away from said vertical reference plane;

a pair of second tool spindles rotatably supported on said plate means and projecting toward said index plate, said second spindles defining a second reference line which extends horizontally between and intersects the rotational axes of said second spindles, said second reference line being parallel to and spaced from said first reference line;

second means movably supporting said second spindles on said plate means so that said second spindles are symmetrically disposed on opposite sides of said vertical reference plane;

second means for selectively adjusting said second supporting means for causing said second spindles to be simultaneously and synchronously moved on opposite sides of said vertical reference plane, said second adjusting means including (1) a first adjusting device for causing said second spindles to be simultaneously and synchronously moved in opposite directions along said second reference line selectively toward or away from said vertical reference plane and (2) a second adjusting device for causing both of said second spindles to be simultaneously and synchronously moved selectively toward or away from said first reference line, said first and second adjusting devices being independently controllable for selecting the desired movement and the resulting locations of said second spindles;

whereby said first adjusting means and said first and second adjusting devices can be individually selectively adjusted so as to selectively position the four spindles at uniformly spaced intervals on a pitch circle of selected diameter, with said base slide means being selectively slidably displaced along said horizontal direction until the vertical axis of rotation of said index plate is vertically aligned with the center of said pitch circle, thereby permitting simultaneous drilling or tapping of at least four holes in a workpiece with said holes being uniformly spaced apart and located on the pitch circle of selected diameter.

4,066,379

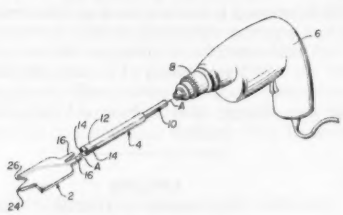
ROTARY TOOL ASSEMBLY HAVING REMOVABLE WORKING ELEMENTS

Peter J. H. Prohaska, Rte. 5, Box 683-A, Ocala, Fla. 32670

Filed Apr. 23, 1976, Ser. No. 679,599

Int. Cl.[2] B23B *51/00*

U.S. Cl. 408—125 **9 Claims**



1. A rotary tool assembly comprising

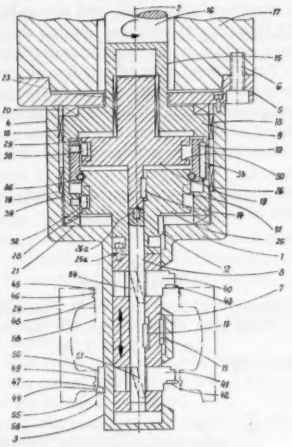
a shank having a driven end portion for connection to a drive means and a tool-receiving end portion for removably receiving a working element, said shank having a plurality of longitudinal slots in said tool-receiving end portion, each of said longitudinal slots having side walls and a bottom wall which is located radially outwardly from the central longitudinal axis of the shank, said bottom wall forming an angle with the central longitudinal axis of the shank,

a working element which is removable from and unbonded to the shank, said working element having a shank-receiving end provided with driven end segments removably positioned in said slot of said shank, said driven end segments each contacting the bottom wall of a respective one of said slots to prevent radial movement between the working element and the shank, said driven end segments each contacting one of said side walls of a respective one of said slots to receive torque delivered to the working element by the shank.

4,066,380
COMBINED BORING AND THREADING TOOL

Hans Werner Beck, and Herbert Paul Jäger, both of Sinsheim, Germany, assignors to The Valeron Corporation, Oak Park, Mich.

Filed May 20, 1976, Ser. No. 688,417
Claims priority, application Germany, May 27, 1975, 2523460
Int. Cl.[2] B23B 5/46, 29/034
U.S. Cl. 408—125 12 Claims

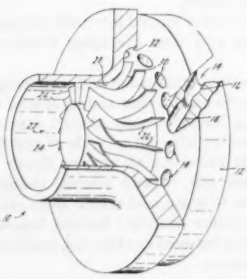


1. A threading tool comprising a rotatable body, a cutter holder carrier mounted with means for axially displaceable conjoint rotation with said rotatable body, a cutter holder mounted with means for radial displacement on said carrier, first cam actuated means for producing axial displacement of said carrier relative to said body, second cam actuated means for producing radial displacement of said cutter holder relative to said carrier, cam actuating means adapted to actuate said first and second cam actuated means, and interengaging cam means between said cam actuated and cam actuating means formed to provide sequential radial displacement of said cutter holder preparatory to a thread chasing operation followed by axial displacement of said carrier at a rate per revolution based on the required thread pitch during rotation of said body.

4,066,381
TURBINE STATOR NOZZLES

Ernest R. Earnest, Hobe Sound, Fla., assignor to Hydragon Corporation, Lake Park, Fla.

Filed July 19, 1976, Ser. No. 706,809
Int. Cl.[2] F01D 9/02
U.S. Cl. 415—202 4 Claims

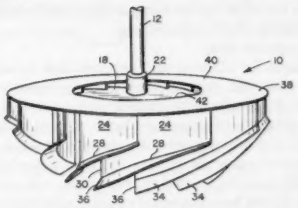


1. A turbine comprising a housing, a radially inflow rotor positioned in said housing, a stator having a plurality of passages therein, each of said passages having an inlet and an outlet and forming nozzles in an axial-tangential plane relative to the axis of the turbine, said outlets of said passages opening into an annular cavity surrounding said rotor.

4,066,382
SURFACE AERATION IMPELLER

Michael B. Lakin, Rochester, and James R. Lindsay, Hilton, both of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed June 18, 1976, Ser. No. 697,520
Int. Cl.[2] B01D 47/16
U.S. Cl. 416—186 A 1 Claim



1. An impeller for aerating a liquid and adapted to be affixed to a rotating shaft, comprising:

a. a support disk having a circular outer edge and upper and lower surfaces;

b. means for affixing said support disk to said rotating shaft so that said support disk is maintained in a substantially perpendicular relationship with said shaft;

c. a plurality of impeller blades;

d. cover means for creating an air intake opening above said upper disk surface and for reducing the amount of splashing caused by the rotation of said impeller near the surface of said liquid;

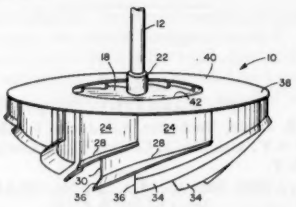
e. means for adjustably securing said impeller blades to said support disk so that said impeller blades extend outwardly from said circular outer edge, extend above said upper disk surface and below said lower disk surface, and so that the degree of radial extension is adjustable, wherein each of said impeller blades has an upper edge which lies in a plane substantially parallel to said support disk and each impeller blade being tapered causing said blades to be widest at the portion closest to said rotating shaft and progressively more narrow as said blade extends outwardly from said support disk, and wherein each of said impeller blades includes a flow inducing fin along the lower edge of the blade, said fins being tapered so as to be widest at the portion closest to said rotating shaft and progressively more narrow as said blade extends outwardly from said support disk; and

f. means for adjustably securing said cover means to the upper edges of said impeller blades so that said cover means is spaced from said upper disk surface and so that the degree of radial extension of said blades remains adjustable, wherein each of said impeller blades includes a flange portion along the upper edge thereof and wherein said means for adjustably securing said cover means to the upper edges of said impeller blades includes a plurality of radially aligned mounting holes in one of said cover means and said flange portions and fastener means adapted to be inserted into one of said mounting holes to thereby adjustably secure said cover means to the upper edges of said impeller blades.

4,066,383
SURFACE AERATION IMPELLER

Michael B. Lakin, Rochester, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed June 18, 1976, Ser. No. 697,519
Int. Cl.[2] B01O 47/16
U.S. Cl. 416—186 R 4 Claims

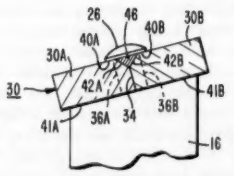


1. An impeller for aerating a liquid and adapted to be affixed to a rotating shaft, comprising:
a. a support disk;
b. means for affixing said support disk to said rotating shaft so that said support disk is maintained in a substantially perpendicular relationship with said shaft; and
c. a plurality of impeller blades affixed to said support disk and extending outwardly therefrom, each of said impeller blades having an upper edge which lies in a plane substantially parallel to said support disk, and each of said impeller blades being tapered causing said blades to be widest at the portion closest to said rotating shaft and progressively more narrow as said blade extends outwardly from said support disk wherein each of said impeller blades is curved along its entire length in the outward direction, and wherein each of said impeller blades includes a flow inducing fin along the lower edge of the blade, said fins being tapered so as to be widest at the portion closest to said rotating shaft and progressively more narrow as said blade extends outwardly from said support disk.

4,066,384
TURBINE ROTOR BLADE HAVING INTEGRAL TENON THEREON AND SPLIT SHROUD RING ASSOCIATED THEREWITH

Frank L. DiFerdinando, West Chester, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 18, 1975, Ser. No. 596,937
Int. Cl.[2] F01D 5/22
U.S. Cl. 416—189 7 Claims

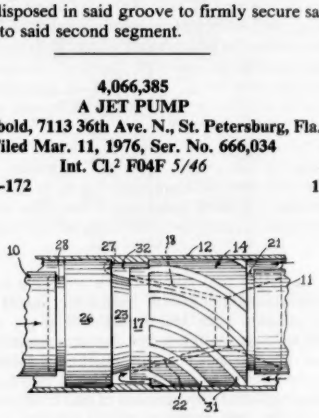


1. An axial flow turbine comprising:
a casing
a rotor shaft extending centrally and axially through said casing,
a plurality of substantially radially extending rotating blades mounted on said rotor, each of said blades having an integral tenon member mounted thereon,
said tenon comprising a stem portion and an integral bulbous cap portion, said stem portion having an upstream and a downstream surface thereon,
a substantially annular shroud member subtending a predetermined number of said plurality of blades, said shroud member comprising a first and a second axial segment, said first axial segment having openings therein sized to accommodate said upstream surface of said stems of said tenons disposed on said blades subtended by said shroud, said second axial segment having openings therein sized to accommodate said downstream surface of said stems,
said first and second segments disposed so that engagement of said first segment with said upstream surface of said tenon stem and engagement of said second segment with said downstream surface of said tenon stem causes said shroud segments to abut along a substantially circumferential interface and dispose the underside of said bulbous cap in simultaneously axially and circumferentially overlapping engagement with said abutted shroud,
an inclined surface extending circumferentially about the axially downstream edge of said first shroud segment,
an inclined surface extending circumferentially about the axially upstream edge of said second shroud segment,
said inclined surfaces cooperating to define a groove extending circumferentially between the abutting shroud segments, and,
a fastener disposed in said groove to firmly secure said first segment to said second segment.

4,066,385
A JET PUMP

Robert J. Diebold, 7113 36th Ave. N., St. Petersburg, Fla. 33710

Filed Mar. 11, 1976, Ser. No. 666,034
Int. Cl.[2] F04F 5/46
U.S. Cl. 417—172 1 Claim



1. A jet pump for use in a piping system having a static liquid head comprising
a. a one-piece elongated sleeve adapted to be connected into the piping system and providing intermediate its ends an internal shoulder,
b. a discharge tube carried within said sleeve and having a diameter less than said sleeve to form a fluid passage therebetween,
c. a venturi within said sleeve and connected at one end to said discharge tube and blocking said passage between said sleeve and said tube,
d. said venturi providing adjacent its opposite end an annular shoulder bearing against one side of said internal shoulder within said sleeve,
e. a restricted throat formed internally of said venturi by first converging and then diverging frustoconically shaped bores,
f. a nozzle within said sleeve and providing a cone-shaped exhaust positioned within and in spaced relation to said converging frustoconically shaped bore of said venturi and terminating adjacent one side of said restricted throat,
g. said nozzle providing an annular flange bearing against the opposite side of said internal shoulder within said sleeve so as to space said nozzle from said venturi,
h. a fluid pressure chamber formed beneath said internal shoulder and between confronting portions of said venturi and said nozzle,
i. a plurality of curved channels formed throughout the periphery of said venturi extending uniformly from said fluid passage to said fluid pressure chamber so as to provide restricted communication therebetween, and

j. a radially extending deflector flange provided by said nozzle adjacent to its bearing contact with said internal shoulder of said sleeve and having an annular groove facing said fluid pressure chamber to reverse the direction of flow of the fluid from said channels over said cone-shaped exhaust of said nozzle and into said venturi and through said restricted throat with sufficient pressure to create a vacuum in said discharge tube.

4,066,386

PRIMING SYSTEMS FOR PUMPS

Christopher Linley Johnson, Hartshorne, near Burton-on-Trent, and Colin Millns, Denby Village, both of England, assignors to Rolls-Royce Limited, London, England

Filed Aug. 23, 1976, Ser. No. 716,798

Claims priority, application United Kingdom, Sept. 6, 1975, 36784/75

Int. Cl.[2] F04B *23/14*

U.S. Cl. 417—199 A **11 Claims**

1. A priming system for a liquid pump having an inlet side and an outlet side, said system comprising:

collecting means on the inlet side of the liquid pump having a contents of liquid and vapor, said collecting means accumulating the vapor from the liquid so that only liquid may be supplied to the liquid pump;

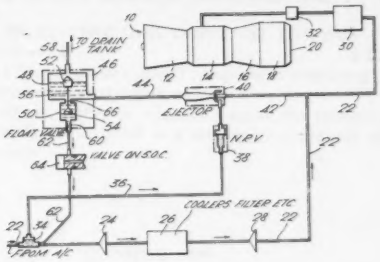
priming pump means for extracting said contents from said collecting means;

duct means extending from said collecting means to said priming pump means and through which said contents of said collecting means is extracted;

separating means for receiving said contents from said priming pump and separating the liquid of the same from the vapor;

further duct means extending from said separating means to said liquid pump for permitting liquid from said separating means to return to the liquid pump; and

said separating means comprising a container having a first means for returning liquid to said further duct means and a second means for discharing vapor from said container,



said first means including a valve initially open to permit return of liquid to the liquid pump and said second means including a second valve initially open to permit discharge of vapor from said container, said second valve being closed when liquid in said container reaches a predetermined level and said first valve being simultaneously operable to restrict the rate of flow of liquid to said further duct means when said liquid in said container reaches the predetermined level.

4,066,387

METHOD OF IMPROVING THE SORPTION CAPACITY OF POLYMERS

Menachem Lewin, and Hilda Guttmann, both of Jerusalem, Israel, assignors to The State of Israel Ministry of Commerce and Industry, Jerusalem, Israel

Filed Feb. 27, 1976, Ser. No. 661,926
Claims priority, application Israel, Mar. 26, 1975, 46937
Int. Cl.[2] D06P *5/00;* B05D *3/04*
U.S. Cl. 8—4 15 Claims

1. A method of improving the sorption capacity of a substantially hydrophobic, thermoplastic polymer, which comprises:
   a. introducing into said polymer a halogen selected from the group consisting of Cl_2, Br_2, I_2, ClI, ClBr, and BrI by contacting the polymer with a solution containing said halogen under conditions which avoid chemical reaction of said halogen with said polymer;
   b. separating the free halogen containing polymer from said solution; and
   c. contacting said polymer with a reagent capable of pervading the polymer and reacting with the free halogen contained therein so as to produce a gas as one of the reaction products, thereby producing said gas.

12. A process for dyeing a substantially hydrophobic, thermoplastic polymer, which comprises treating said polymer prepared by the method of claim 1 and subsequently dyeing the polymer with a dye system selected from the group consisting of aqueous dispersed and basic dye systems.

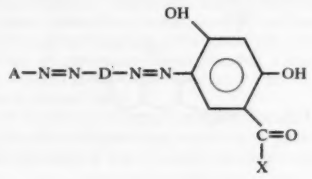
4,066,388

DISAZO DYES DERIVED FROM 1-ACYL-2,4-DIHYDROXYBENZENES AND METALLIZED POLYOLEFIN DYED THEREWITH

Raouf Botros, Beech Creek, Pa., assignor to American Color & Chemical Corporation, Charlotte, N.C.

Filed June 4, 1976, Ser. No. 692,932
Int. Cl.[2] C09B *31/20, 33/04;* D06P *1/04, 3/79*
U.S. Cl. 8—41 D 9 Claims

1. An acyldihydroxybenzene disazo dye of the formula:



wherein

A is phenyl, naphthyl, phenyl substituted by up to three substituents or naphthyl substituted by up to two substituents, said substituents being independently selected from alkyl of 1–4 carbons; alkoxy of 1–4 carbons; nitro; cyano; chloro; bromo; trifluoromethyl; hydroxy; RCOO—, where R is alkyl of 1–4 carbons; carboxy; and ROOC—, where R is alkyl of 1–4 carbons;

D is phenyl, naphthyl, or phenyl or naphthyl substituted by up to 2 substituents independently selected from alkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms, chlorine or bromine; and

X is alkyl of 1–4 carbon atoms, benzyl, phenyl or phenyl substituted by up to two substituents independently selected from alkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms, chloro and bromo.

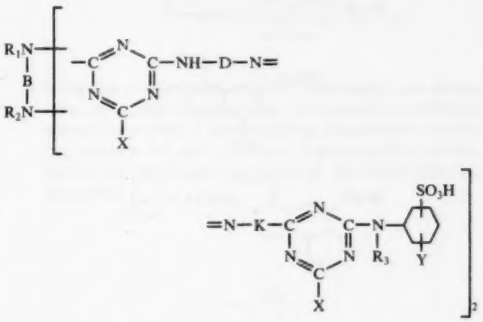
4,066,389

SULFOPHENYLAMINO CONTAINING TETRAREACTIVE TRIAZINE DISAZO DYESTUFFS AND DYESTUFF COMPOSITIONS THEREOF

Henri Riat, Arlesheim, and Gert Hegar, Schonenbuch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 9, 1976, Ser. No. 647,846
Claims priority, application Switzerland, Jan. 15, 1975, 471/75
Int. Cl.[2] C09B *62/08;* D06P *1/382, 3/10, 3/66*
U.S. Cl. 8—41 R 5 Claims

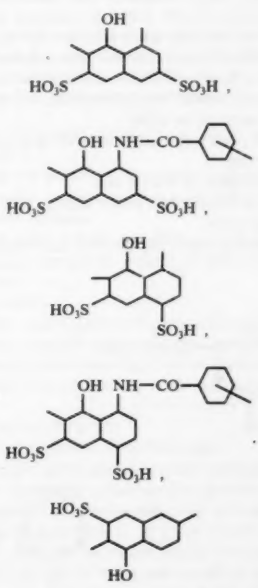
1. In a fiber-reactive dyestuff composition containing
   1. a fiber-reactive dyestuff, and
   2. a diluent, buffer or mixtures thereof; the improvement wherein the dyestuff is a tetrareactive dyestuff of the formula



wherein

D is phenylene substituted by sulfo and is further unsubstituted or substituted by methyl, ethyl, isopropyl, butyl, methoxy, ethoxy, ethoxyethoxy, isopropoxyisopropoxy, acetyl, acetylamino, benzoylamino, ureido, carboxy, chloro or bromo;

K is



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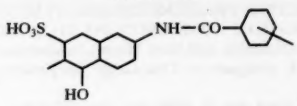

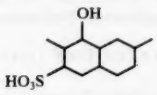

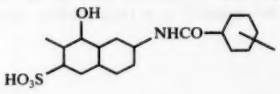

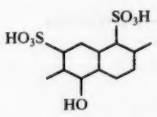

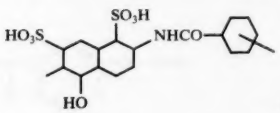

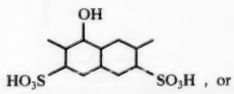

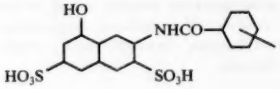

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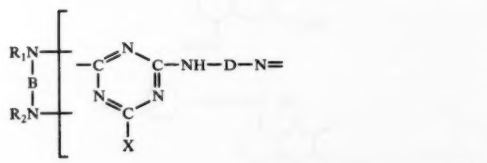
B is straight or branched chain alkylene of 1–6 carbon atoms or cyclohexylene, or is naphthylene, diphenylene, stilbenylene, or phenylene which are unsubstituted or substituted by halo, lower alkyl, lower alkoxy, amino, ureido, hydroxy, carboxy or sulfo;

R_1, R_2 and R_3 independently are hydrogen or alkyl of 1–6 carbon atoms;

X is chloro, bromo or fluoro; and

Y is hydrogen, lower alkyl, lower alkoxy, acetylamino, halo, carboxy or sulfo.

2. A tetrareactive disazo dyestuff of the formula

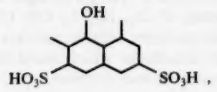


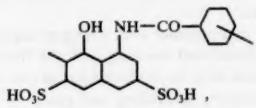
wherein

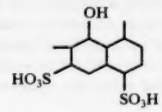
D is phenylene substituted by sulfo and is further unsubstituted or substituted by methyl, ethyl, isopropyl, butyl, methoxy, ethoxy, ethoxyethoxy, isopropoxyisopropoxy, acetyl, acetylamino, benzoylamino, ureido, carboxy, chloro or bromo;

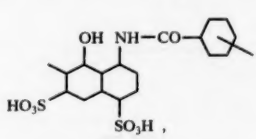
K is

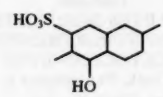
K is











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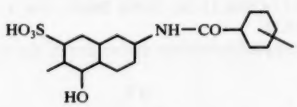

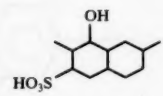

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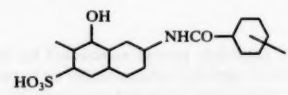

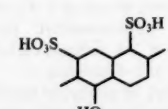

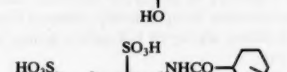

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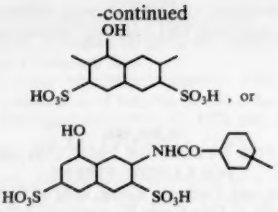


B is straight or branched chain alkylene of 1–6 carbon atoms or cyclohexylene, or is naphthylene, diphenylene, stilbenylene, or phenylene which are unsubstituted or substituted by halo, lower alkyl, lower alkoxy, amino, ureido, hydroxy, carboxy or sulfo;

R_1, R_2 and R_3 independently are hydrogen or alkyl of 1–6carbon atoms;

X is chloro, bromo or fluoro; and

Y is hydrogen, lower alkyl, lower alkoxy, acetylamino, halo, carboxy or sulfo.

4,066,390
STABLE HYDROSULFITE COMPOSITIONS

Nick J. Christie, 29 Dean Road, Mendham, N.J. 07945; Joseph P. Antisavage, 220 E. Washington Ave., Newtown, Pa. 18940, and Eugene E. Brupbacher, 270 E. Mountain Road, Sparta, N.J. 07871

Continuation-in-part of Ser. No. 388,354, Aug. 15, 1973, abandoned. This application Dec. 19, 1975, Ser. No. 642,366

Int. Cl.[2] D06L *3/00*

U.S. Cl. 8—110 **20 Claims**

1. A stable hydrosulfite composition which comprises a dry particulate admixture of:

A. 100 parts of a hydrosulfite selected from the group consisting of an alkali metal hydrosulfite, ammonium hydrosulfite, zinc hydrosulfite, and mixtures thereof (based on an assay value of 100% hydrosulfite);

B. 37.5–214 parts of a pH builder selected from the class consisting of sodium, potassium, or ammonium carbonate, sesquicarbonate, or bicarbonate, and mixtures thereof;

C. 37.5–286 parts of a pH buffer selected from the class consisting of trisodium phosphate, tripotassium phosphate, triammonium phosphate, disodium phosphate, dipotassium phosphate, diammonium phosphate, sodium tripolyphosphate, potassium tripolyphosphate, ammonium tripolyphosphate, tetrasodium pyrophosphate, tetrapotassium pyrophosphate, tetrammonium pyrophosphate, a sodium or potassium silicate having a molar ratio of silica to alkali metal oxide of about 0.5 to 3.3, borax, and mixtures thereof; and

D. 0.9–14.15 parts of a thermal stabilizer for the hydrosulfite, said thermal stabilizer being a sodium or potassium salt of an alkanoic acid of 1 to 12 carbon atoms or a benzoic acid.

4,066,391
FLAME RETARDANT FINISH FOR TEXTILES

Robert George Weyker, North Plainfield, and William Frederick Baitinger, Jr., Hillsborough Township, Somerset County, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

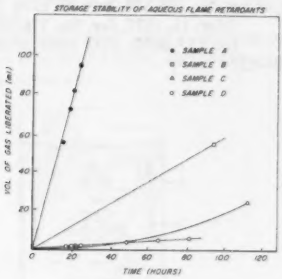
Division of Ser. No. 197,980, Nov. 11, 1971, Pat. No. 4,026,711, which is a continuation-in-part of Ser. No. 147,566, May 27, 1971, abandoned. This application Feb. 9, 1976, Ser. No. 656,451

Int. Cl.[2] C09D *5/18*

U.S. Cl. 8—116 P **5 Claims**

1. A process for preparing an aqueous flame retardant composition comprising tetrakis(hydroxymethyl)phosphonium phosphate, tetrakis(hydroxymethyl)phosphonium carboxylate, and a urea or a urea-formaldehyde condensate, or both comprising

reacting 1 mole of tris(hydroxymethyl)phosphine, at least 1 mole of formaldehyde and 1 mole of combined orthophosphoric acid and a carboxylic acid, the phosphoric acid representing between 10 and 75 mole percent and the carboxylic acid between 90 and 25 mole percent of the combined acids to obtain a concentrated solution and



diluting the concentrated solution with water and adding urea or a urea-formaldehyde condensate in sufficient amount to provide a flameproofing composition containing between 0.5 and 3.0 moles of urea and/or urea-formaldehyde condensate per mole of combined phosphonium salts.

4,066,392
PROCESS FOR MODIFYING KERATINOUS MATERIALS

Heinz Abel, Reinach, and Rosemarie Topfl, Dornach, both of Switzerland, assignors to I.W.S. Nominee Company Limited, London, England and Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 480,083, June 17, 1974, abandoned. This application Sept. 15, 1975, Ser. No. 613,649

Claims priority, application Switzerland, June 21, 1973, 9026/73

Int. Cl.[2] D06M *13/26, 13/38, 15/12, 15/52*

U.S. Cl. 8—127.5 **77 Claims**

1. A process for modifying keratinous material, which comprises treating said material with organic solutions or aqueous emulsions which contain

1. polythiols with at least two thiol groups in the molecule and having a molecular weight of 400 to 20,000 and obtained from
   a. polyalcohols
   b. alkylene oxides and/or dicarboxylic acids and
   c_1. carboxylic acids containing thio groups, or from
   c_2. epihalohydrins and alkali metal hydrogen sulphides, the polythiols containing ether and/or ester bonds, or from
   a_1. polycarboxylic acids
   b_1. alkylene oxides or dialcohols and
   c_1. carboxylic acids containing thio groups,
2. nitrogen-containing condensation products of epoxides which contain at least two epoxide groups in the molecule, fatty amines with 12 to 24 carbon atoms, dicarboxylic acids with 1 to 14 carbon atoms, the equivalent ratios of epoxide groups to hydrogen bound to amino nitrogen to carboxylic acid groups being 1:(0.1–1):(1–0.55), and subsequently drying the treated material.

4,066,393

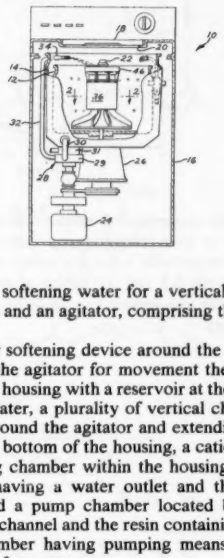
REUSABLE WATER SOFTENER SYSTEM FOR CLOTHES WASHER

Everett D. Morey, Louisville, Ky., and Eddie W. Dooley, Jeffersonville, Ind., assignors to General Electric Company, Louisville, Ky.

Division of Ser. No. 708,278, July 23, 1976. This application Mar. 11, 1977, Ser. No. 776,505

Int. Cl.[2] B08B *3/00;* **D06F** *39/00*

U.S. Cl. 8—137 **6 Claims**



1. The method of softening water for a vertical axis clothes washer having a tub and an agitator, comprising the following steps:

a. placing a water softening device around the agitator and attaching it to the agitator for movement therewith, said device having a housing with a reservoir at the top thereof for receiving water, a plurality of vertical channels radially disposed around the agitator and extending from the reservoir to the bottom of the housing, a cation exchange resin containing chamber within the housing, the top of said chamber having a water outlet and the bottom a water inlet, and a pump chamber located between the bottom of each channel and the resin containing chamber, said pump chamber having pumping means to provide water pumping force,

b. introducing water into the tub,

c. operating the agitator in an oscillatory back and forth motion thereby oscillating the water softener device,

d. recirculating water from the tub into the reservoir of the water softener device during oscillation of the device,

e. flowing water from the reservoir downwardly through the vertical channels to the bottom of the housing,

f. pumping water from the bottom of the housing upwardly through the cation exchange resin to thereby remove calcium and magnesium ions from the water to effect a reduction of hardness of the water, and

g. discharging the softened water from the water softening device into the tub.

4,066,394

REUSABLE ZEOLITE WATER SOFTENER FOR CLOTHES WASHING

Ralph Spencer Leonard, Berkeley Heights, N.J., assignor to Colgate-Palmolive, New York, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,223

Int. Cl.[2] B08B *3/00;* **C02B** *1/42;* **C08J** *9/00;* **C11D** *17/00*

U.S. Cl. 8—137 **10 Claims**

1. A method of washing soiled textiles comprising the step of agitating said soiled textiles in an aqueous washing solution at a temperature in the range of 80° F. to 200° F. in a washing machine in the presence of (A) a detersive proportion of a water-soluble nonionic or anionic surfactant and (B) a product comprising 20 to 300 parts by weight of particles of a water-insoluble, inorganic aluminosilicate having at least about one atom of aluminum for every three atoms of silicon, a cation selected from the group consisting of sodium, potassium, ammonium, lithium and hydrogen, and a particle size of less than ten microns incorporated in 100 parts by weight of a water-insoluble hydrophilic poly(urea/urethane) substrate having an open porous structure, said product being effective to remove calcium and magnesium ions from said washing solution.

4,066,395

PROCESS FOR DYEING OR PRINTING AROMATIC POLYAMIDE FIBRES

Charles Soiron, and Karlheinz Keller, both of Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 26, 1975, Ser. No. 635,527

Claims priority, application Switzerland, Dec. 2, 1974, 15958/74

Int. Cl.[2] D06P *5/04*

U.S. Cl. 8—169 **15 Claims**

1. In a process for dyeing or printing aromatic polyamide fibers with a dye liquor comprising a cationic dye, water, and a non-ketonic carrier in an amount of 5 to 30 grams per liter of dye liquor, the improvement which comprises further including in the dye liquor 0.1 to 5 g. per liter of an anionic assistant selected from the group consisting of a sulfonated fatty alcohol of 8 to 22 carbon atoms, a sulfonated alkylnaphthalene containing an alkyl group of 8 to 22 carbon atoms, a sulfosuccinic acid alkyl ester containing an alkyl group of 8 to 22 carbon atoms, a dodecyldiphenyl ether disulfonic acid, a sulfonated castor oil, and dinitrobenzenesulfonate, as the free acid or as the alkali metal, ammonium or amine salt.

4,066,396

DYEING DRY-SPUN AROMATIC POLYAMIDES

Gerhard Dieter Wolf; Ralf Miessen; Hans Egon Künzel, all of Dormagen, and Francis Bentz, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 7, 1975, Ser. No. 602,784

Claims priority, application Germany, Aug. 10, 1974, 2438546

Int. Cl.[2] D06P *3/24*

U.S. Cl. 8—178 A **11 Claims**

1. A process for the production of dyed filaments of aromatic polyamides which comprises continuously dyeing dry-spun gel filaments of an aromatic polyamide which has not been modified with acid or basic groups before or during stretching, in an aqueous dyebath containing a water-soluble, cationic dye in dissolved form.

4,066,397

TEXTILE MATERIALS HAVING IMPROVED ELASTICITY AND METHOD FOR PRODUCING SAME

Clifford Charles Carroll, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 26, 1976, Ser. No. 735,327

Int. Cl.[2] D06M *13/42, 15/52*

U.S. Cl. 8—192 **22 Claims**

1. A method for improving the elasticity of a textile material which comprises impregnating a preshrunk textile material maintained in a relaxed state with a liquid admixture consisting essentially of a polyisocyanate, a polyether diol and a polyether polyol having at least three hydroxyl groups per molecule, said polyether diol and polyether polyol each having a molecular weight of from about 300 to about 12,000 and said polyisocyanate being present in said admixture in an amount sufficient to provide a ratio of isocyanate groups to hydroxyl groups in said admixture of at least about 1.1:1, reacting said polyisocyanate with said polyether diol and polyether polyol to provide a polymeric impregnated textile material and curing said polymeric impregnated textile material.

4,066,398

CORROSION INHIBITION

Chih Ming Hwa, Arlington Heights, Ill., assignor to Chemed Corporation, Cincinnati, Ohio

Continuation of Ser. No. 350,858, April 13, 1973, abandoned, which is a continuation of Ser. No. 136,592, April 22, 1971, abandoned. This application Nov. 12, 1974, Ser. No. 523,096
Int. Cl.[2] C23F *11/16, 11/14*
U.S. Cl. 21—2.7 A 5 Claims

1. A method for inhibiting corrosion of a metal surface consisting of a member of the group consisting of steel and aluminum, which consists of maintaining in an aqueous fluid in contact with said surface a corrosion inhibiting amount of a corrosion inhibiting composition consisting essentially of:

a. water-soluble hydroxyamine phosphate ester, said amine phosphate ester comprising the reaction product of polyphosphoric acid, phosphorus pentoxide or a mixture of polyphosphoric acid and phosphorus pentoxide with a water-soluble hydroxyamine;

b. sufficient water-soluble zinc compound to provide from 0.005 to 15 parts by weight of zinc ion for each part by weight of said phosphate ester; and

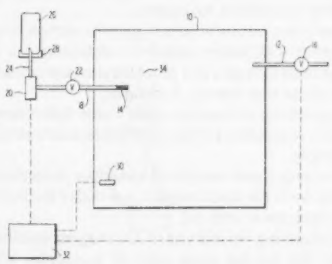
c. sufficient water-soluble 1,2,3-triazole to provide from 0.005 to 15 parts by weight of said azole or azole derivative for each part by weight of said phosphate ester.

4,066,399

METHOD FOR HUMIDIFYING A GAS STERILIZER

Donald A. Gunther, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Division of Ser. No. 262,313, June 13, 1972, Pat. No. 3,936,270. This application Sept. 26, 1975, Ser. No. 617,244
Int. Cl.[2] A61L *1/00, 3/00, 13/00;* A23L *3/34*
U.S. Cl. 21—58 4 Claims



1. In a gas sterilization process carried out in a sterilizing chamber and involving humidification of materials within the chamber and subsequently involving introduction of sterilizing gas, the steps comprising

a. providing improved humidification by

i. providing a combination of water and water soluble organic solvent whose presence increases vapor pressure, decreases surface tension and lowers polarity, said solvent being selected from the group consisting of lower alcohols, ketones and ethers; and

ii. introducing such combination of water and organic solvent into the sterilizing chamber, the presence of the organic solvent improving the permeability of such combination through the pores of materials within such chamber; and

b. subsequent to step (a), introducing into the sterilization chamber sterilizing gas comprising ethylene oxide.

4,066,400

BUOYANT SOLID COVER FOR PONDS AND METHOD OF MAKING THE SAME

James P. Cox, 246 E. Bartlett Road, Lynden, Wash. 98264, and Robert W. Beach, 4262 NE. 125th, Seattle, Wash. 98125

Filed Nov. 12, 1975, Ser. No. 630,997
Int. Cl.[2] B01J *1/18*
U.S. Cl. 21—60.5 R 32 Claims

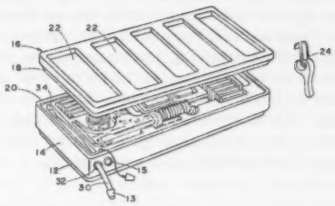
1. A buoyant solid sheet pond cover comprising petroleum wax of a thickness of at least 3/16 in., and reinforcement integral with the petroleum wax.

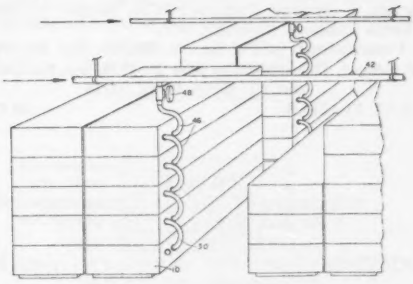
4,066,401

LONG TERM STORAGE APPARATUS

Arie Solomon, 5 Anderston St., Ramat-Aviv, Tel-Aviv, Israel

Filed Apr. 29, 1976, Ser. No. 681,477
Claims priority, application Israel, May 5, 1975, 47235
Int. Cl.[2] C23F *15/00;* A23L *3/00*
U.S. Cl. 21—61 7 Claims





1. A long-term storage system for connection to a continuous or intermittent supply of inert gas comprising:

a plurality of long-term, hermetically sealable individually transportable storage containers each storage container having first and second gas communication terminals communicating with the interior thereof;

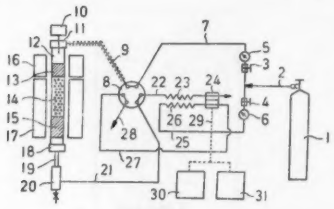
selectably decouplable serial interconnection conduit means for serial coupling of respective first and second communication terminals of adjacent ones of said plurality of storage containers and for coupling said serially connected storage containers to a continuous or intermittent gas supply; and

means for preventing egress of inert gas from individual ones of said containers when said individual ones of said containers are not coupled to a gas supply or to adjacent ones of said containers.

4,066,402
ANALYTICAL METHOD AND APPARATUS FOR DETERMINATION OF TOTAL NITROGEN AND/OR CARBON CONTENTS IN AQUEOUS SYSTEMS

Yoshiki Komiyama, Takatsuki; Seiya Yamamoto, Ashiya, and Yoshiaki Yasumasa, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 14, 1976, Ser. No. 686,635
Claims priority, application Japan, May 15, 1975, 50-58339
Int. Cl.[2] G01N *33/18, 1/10, 27/18*
U.S. Cl. 23—230 PC 25 Claims

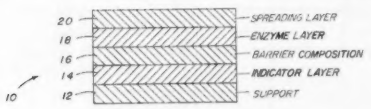


1. An analytical method for determination of the total nitrogen and/or carbon contents in an aqueous solution containing nitrogenous and/or carbonaceous materials as a specimen, which comprises introducing the aqueous solution with an inert gas containing substantially no nitrogen and/or carbon dioxide as a carrier gas into a reactor tube packed with a destructive oxidation catalyst and/or a reducing agent and/or an oxidizing agent, maintaining the reaction tube at elevated temperatures so as to decompose the nitrogenous and/or carbonaceous materials to nitrogen and/or carbon dioxide and measuring the amounts of nitrogen and/or carbon dioxide in the resulting gaseous mixture from the reactor tube by the use of a thermal conductivity gas chromatograph.

4,066,403
MULTILAYER ANALYTICAL ELEMENT

Barbara J. Bruschi, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 588,755, June 20, 1975, abandoned. This application May 20, 1976, Ser. No. 688,446
Int. Cl.[2] G01N *31/22, 33/16*
U.S. Cl. 23—230 B 50 Claims



33. A process of analyzing a liquid for the presence of a predetermined analyte, comprising the steps of

a. depositing a sample of the liquid on an element comprising a first reagent capable of producing a radiant energy detectable species and having in association with it a binder, a second reagent capable of producing from the analyte a decomposition product which is interactive with said first reagent; and a barrier composition separating substantially all of said second reagent from said first reagent, said composition being substantially uniformly permeable to said decomposition product and substantially impermeable to interferants;

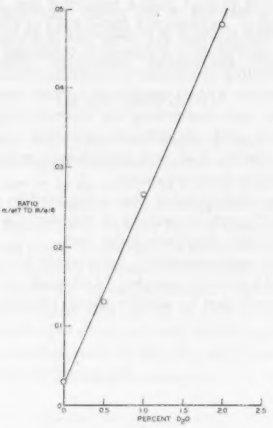
whereby the analyte and the second reagent react to produce a decomposition product that selectively permeates through the barrier composition where it reacts with the first reagent; and

b. measuring said detectable change.

4,066,404
DETERMINATION OF DEUTERIUM CONCENTRATION IN WATER

Thomas D. Morgan, and Robert B. Regier, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 2, 1976, Ser. No. 711,032
Int. Cl.[2] B01J *25/02;* G01N *33/18, 33/24*
U.S. Cl. 23—230 EP 5 Claims



1. A method for determining a concentration of deuterium in water which comprises the steps of:

a. equilibrating consecutively at least two water samples having known and varied deuterium concentrations with the same amount of hydrocarbon reagent to allow exchange of hydrogen and deuterium between water and the hydrocarbon reagent until sufficient amount of deuterium migrated to permit the analysis of the mass ratio of isotopes of the equilibrated reagent containing deuterium to those containing hydrogen;

b. analyzing consecutively the hydrocarbon reagents equilibrated with water samples to determine for each sample the mass isotope ratio of molecules that contain deuterium to those that contain hydrogen;

c. correlating the isotope mass ratios determined in step (b) with respective known deuterium concentrations of each sample;

d. reacting water sample of unknown deuterium concentration with the same reagent and under the same conditions as samples in step (a);

e. establishing by analysis of the reagent equilibrated in step (d) the isotope mass ratio of molecules which contain deuterium to those that contain hydrogen; and

f. converting the isotope ratio determined in step (e) to deuterium concentration in water using the correlation obtained in step (c).

4,066,405
METHOD FOR TOTAL PROTEIN FRACTIONATION AND ANALYSIS OF HUMAN SALIVA

Robert I. Henkin, Bethesda, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Continuation of Ser. No. 547,464, Feb. 6, 1975, abandoned. This application Oct. 4, 1976, Ser. No. 729,157
Int. Cl.[2] G01N *33/16, 21/00, 21/52, 31/08*
U.S. Cl. 23—230 B 37 Claims

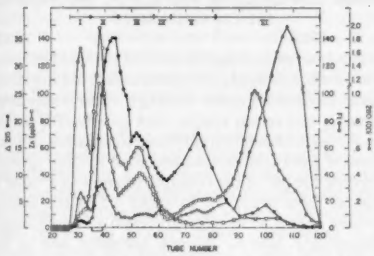
1. A method for analyzing saliva to determine the total protein content thereof comprising the steps of:

fractionating the protein components of said saliva on a

molecular sieve, said protein components separating as a function of their molecular weights and aromaticity;

collecting separate aliquots of said fractionated saliva;

measuring protein parameters dependent upon (1) the



amount of the peptide chromophore; (2) the amount of tyrosine and tryptophan; and (3) the quantum yield of tryptophan; and (4) the zinc concentration in each aliquot;

recording said measured parameters to provide a total protein fractionation record.

4,066,406

PROCESS AND APPARATUS FOR THE VOLTAMMETRIC MEASUREMENT OF THE QUANTITY OR MASS OF SEPARATED SAMPLE COMPONENTS

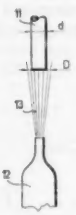
Erno Pungor, and Maria Varadi, both of Budapest, Hungary, assignors to Labor Muszeripari Muvek, Esztergom, Hungary

Filed Apr. 15, 1976, Ser. No. 677,389

Claims priority, application Hungary, Apr. 22, 1975, LA 863

Int. Cl.[2] G01N *27/26, 27/30, 31/08*

U.S. Cl. 23—230 R **3 Claims**



1. A process for voltammetric measurement of sample component quantities in a liquid comprising the steps of:

pulsatingly conveying said liquid as a jet of liquid flow along a path substantially perpendicular to and into contact with a voltametric electrode surface whereby a voltametric current is produced;

adjusting the cross section of the jet of liquid flow so that said cross section is greater than the measurement surface of the electrode in the region of the electrode surface;

sampling the produced voltametric current only during that time period from when said jet of liquid flow has attained at least 50% of its maximum velocity, as it increases towards said maximum velocity, and, after attaining the maximum velocity until the velocity decreases to 50% of said maximum velocity;

integrating the sampled current signal and determining said component quantities therefrom.

4,066,407

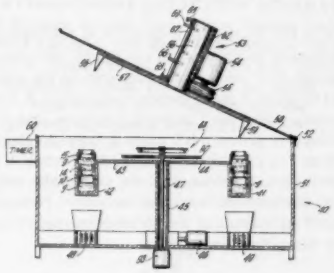
BODY FLUID TESTING SYSTEM AND PROCESS

Vincent Lupica, 2621 Palisade Ave., Riverdale, N.Y. 10463

Filed Dec. 16, 1976, Ser. No. 751,108

Int. Cl.[2] G01N *33/16, 1/18*

U.S. Cl. 23—230 B **4 Claims**



4. A process for performing tests upon body fluids comprising the following steps in sequence:

collecting body fluid in an accurately prescored capillary micropipette having opposed open ends and a squeeze bulb fluid ejecting means at one of its ends; stopping an end of said pipette; centrifuging said pipette; breaking off said pipette at its score line to yield an accurate and predetermined volume of fluid retained in said pipette above said score line; transferring said predetermined volume of fluid to the uppermost cell of a multi-celled stacked container with each cell having therein a pre-measured test reagent, and said container having rupturable liquid-impermeable membranes between said cells; said transfer occurring by squeezing said squeeze bulb and thereby injecting said fluid into said uppermost cell; agitating the contents of said container; rupturing the membrane between the uppermost cell and the next cell, thus causing the fluid and reagent in the first cell to mix with the reagent in the next cell; agitating the resulting mixture, and performing a test on the resulting fluid.

4,066,408

CHROMOGEN-REACTIVE-INDICATOR PREPARATIONS CONTAINING A 3,3'-DI(CARBONYLOXY- OR SULFONYLOXY-GROUP-CONTAINING) BENZIDINE DERIVATIVE CHROMOGEN

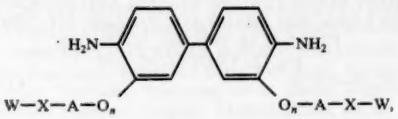
Nils Ake Jonsson, Solna; Ferenc Merenyi, and Lars-Erik Westlund, both of Taby, all of Sweden, assignors to AB Kabi, Stockholm, Sweden

Continuation-in-part of Ser. No. 515,195, Oct. 16, 1974, Pat. No. 4,008,267, which is a continuation-in-part of Ser. No. 118,531, Feb. 24, 1971, Pat. No. 3,859,341. This application Feb. 9, 1977, Ser. No. 766,961

Int. Cl.[2] G01N *21/06, 31/22*

U.S. Cl. 23—230 R **18 Claims**

1. In an analytical test, color change reagent preparation comprising a chromogen-reactive-indicator, peroxidase, an oxygen-oxidoreductase specific to a particular substance to be tested and for which there exists a specific oxygen-oxidoreductase, the improvement which consists in using as the chromogen-reactive-indicator constituent of said preparation a 3,3'-disubstituted-benzidine derivative selected from (a) those having the general formula



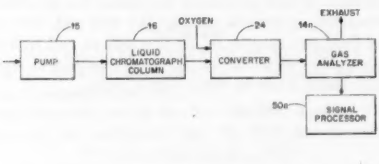
wherein X is the divalent carbonyloxy or sulfonyloxy group, W is hydrogen or another cation compatible with the aforesaid other ingredients of said reagent preparation, the subscript *n* is 0 or 1, and (i) when X is the carbonyloxy group, A is a divalent alkylene chain with from 2 to about 7 carbons, and (ii) when X is the sulfonyloxy group, *n* is 0 when A is the divalent alkylene chain of from 2 to about 7 carbons, and *n* is 1 when A is straight chain trimethylene or tetramethylene, and (b) the acid addition salts of said disubstituted benzidine derivative, compatible with the aforesaid ingredients of the chromogen-reactive-indicator, when X is the carbonyloxy group.

4,066,409

METHOD AND APPARATUS FOR CHROMATOGRAPHICALLY ANALYZING A LIQUID SAMPLE

David H. Fine, Framingham, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed Jan. 19, 1977, Ser. No. 760,604
Int. Cl.[2] G01N *31/08*
U.S. Cl. 23—230 PC **11 Claims**



1. A chromatographic analysis method for the selective detection in a sample of organic nitrogen containing compounds, the method comprising the steps of:

in a liquid chromatograph, chromatographically separating organic nitrogen containing compounds from other compounds in a liquid sample and discharging such separated compounds from the chromatograph in timewise distribution;

injecting into a converter at least the portion of the sample having therein organic nitrogen containing compounds discharged from the chromatograph;

introducing into the converter oxygen in an amount sufficient to fully oxidize combined nitrogen in organic compounds within that portion of the sample injected into the converter;

in the converter, oxidizing the organic nitrogen containing compounds discharged from the chromatograph at a temperature not substantially less than 600° C or substantially greater than 1800° C for converting the nitrogen in such organic nitrogen containing compounds to nitric oxide;

transferring effluent from the converter to a nitric oxide detector; and

measuring in the nitric oxide detector the nitric oxide transferred from the converter.

4,066,410

THYROID HORMONE ASSAY

Anna M. Eisentraut, Dallas, Tex., assignor to Nuclear-Medical Laboratories, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 613,092, Sept. 15, 1975, abandoned. This application Feb. 2, 1976, Ser. No. 654,541
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230.6 **20 Claims**

1. A method of measuring the level of thyroid hormone in a sample of serum containing endogenous thyroid hormone and endogenous thyroid hormone binding protein comprising:

a. admixing said serum sample with an effective amount of an aqueous acid solution sufficient to separate said thyroid hormone from said thyroid hormone binding protein;

b. adjusting the pH of the resulting mixture to a value in the range of from about 7.0 to about 8.5 in the absence of blocking agents while adding thereto a known amount of radioactively labeled thyroid hormone and a known amount of thyroid hormone binding antibodies and allowing the resulting solution to equilibrate;

c. thoroughly admixing the resulting equilibrated mixture from step (b) with an aqueous solution of a water soluble sulfate which contains sufficient sulfate such that the resulting mixture has a sulfate concentration between about 20 and 30 weight percent to thereby result in precipitation of said thyroid hormone binding protein material containing thyroid hormone bound thereto and leave free thyroid hormone in the solution;

d. separating the precipitated material from said solution; and

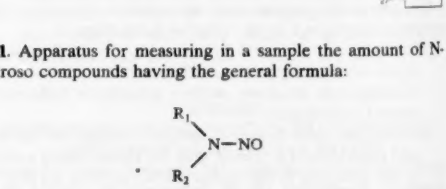
e. counting with a scintillation counter one of (1) the free radioactively labeled thyroid hormone in said resulting solution, and (2) the bound radioactively labeled thyroid hormone bound to said thyroid hormone binding antibodies in said precipitate.

4,066,411

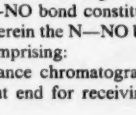
N-NITROSO COMPOUND ANALYZER WITH SAMPLE ATOMIZATION

David H. Fine, Framingham; John J. Fronduto, Waltham, and David P. Rounbehler, Harwichport, all of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Jan. 19, 1977, Ser. No. 760,603
Int. Cl.[2] G01N *31/08*
U.S. Cl. 23—253 PC **7 Claims**



1. Apparatus for measuring in a sample the amount of N-nitroso compounds having the general formula:



wherein R_1 and R_2 are the same or different organic radicals, including those radicals which together with the non-nitroso N of the depicted N—NO bond constitute a nitrogen heterocyclic radical, and wherein the N—NO bond is the weakest bond in the molecule, comprising:

A. high performance chromatograph including a column, having an input end for receiving said sample in liquid

solution form with a solvent and an output end for ejecting column effluent, wherein the ejection of the N-nitroso portion having N-nitroso compounds therein is separate in time from the ejection of other portions of said sample having other compounds therein and further wherein ejections of portions having different N-nitroso compounds are separate in time from each other;

B. chamber means for pyrolyzing said column effluent at a temperature in the range 300° to 500° C to liberate from said N-nitroso compounds nitric oxide (NO) in the gaseous phase;

C. liquid-gas interface means having an effluent delivery means extending into said chamber means for conveying and discharging liquid chromatograph effluent thereinto and carrier gas delivery means for directing carrier gas into said chamber means, said effluent delivery means and said carrier gas delivery means cooperating to atomize liquid effluent into said chamber means, both said delivery means cooperating to promote transfer of heat from said chamber means to said liquid effluent and said carrier gas prior to said atomization, said interface means and said chamber means cooperating to vaporize column effluent as a continuous process for preserving the timewise separation of N-nitroso compounds therein;

D. means for establishing a sub-atmospheric pressure in said chamber means for promoting vaporization of said column effluent;

E. means for measuring in the gaseous phase the amount of nitric oxide (NO) liberated in said chamber means; and

F. a cold trap interposed between said chamber means and said measuring means for removing chromatograph solvent from the input to said measuring means, said cold trap including an input port for receiving a cold trap input gas from said chamber means and an output port for injecting gaseous cold trap effluent into said measuring means.

4,066,412

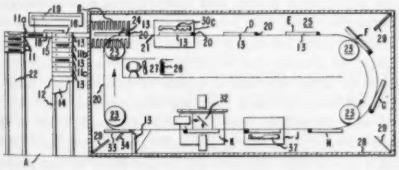
AUTOMATIC CLINICAL ANALYZER

Donald R. Johnson, Wilmington; Richard G. Nadeau; Gerrit Nieuweboer, both of Claymont, all of Del., and William L. Truett, Blackwood, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 545,494, April 26, 1966, Pat. No. 3,476,515. This application Aug. 16, 1968, Ser. No. 753,197

Int. Cl.² G01N *33/16, 21/24*

U.S. Cl. 23—253 R **60 Claims**



1. An automated analytical apparatus comprising means to carry a plurality of reagent-storing disposable chemical testing containers; means to transfer at least a portion of a sample from a sample storage site to a reaction compartment within one of the plurality of disposable containers; at least one means for the addiion of at least one reagent stored within the disposable container to the reaction compartment forming a reaction mixture; means further along the path of travel of said carrying means to monitor at least one of the physical properties of the reaction mixture within the disposable container; said monitoring means including light source means and means responsive to the magnitude of light absorbed by the reaction mixture as light is transmitted therethrough from said light source means, said monitoring means further including means to compress said disposable container between said light source means and said responsive means during analysis to define a fixed optical path length through the reaction mixture; and means to advance said carrying means through said sample transfer and reagent addition means to said monitoring means.

4,066,413

GAS COMPONENT DETECTION APPARATUS

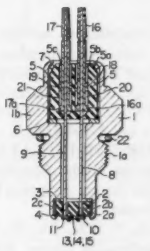
Yoshihiro Segawa; Susumu Sato; Eturo Yasuda; Tadashi Hattori, all of Okazaki, and Keiji Aoki, Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Mar. 1, 1976, Ser. No. 662,956

Claims priority, application Japan, Mar. 3, 1975, 50-26374; Dec. 15, 1975, 50-149729

Int. Cl.² G01N *27/16*

U.S. Cl. 23—254 E **21 Claims**



1. A gas component detection apparatus for detecting the concentration of oxygen contained in an exhaust gas from an internal combustion engine and determining an air-fuel ratio of an air-fuel mixture supplied thereto comprising:

a gas component detecting element composed of a semiconductive metal oxide, said detecting element having a surface and being contacted by an exhaust gas and exhibiting variable electric resistances according to the concentration of oxygen contained therein,

two electrodes disposed in a spaced relation either on the surface of said detecting element exposed to the exhaust gas or within said detecting element adjacent that exposed surface,

a catalyst promoting at least an oxidation reaction of the exhaust gas, and

a porous coating layer having an exhaust gas permeability, said coating layer being formed of a metal oxide having electrically insulating properties,

said catalyst and said coating layer covering the surface of said detecting element exposed to the exhaust gas.

4,066,414

ONE PIECE TUBE AND MICROSCOPE SLIDE MANIPULATIVE LABORATORY DEVICE

Donald Selby, 107 Ray St., Freeport, N.Y. 11520

Filed Feb. 15, 1977, Ser. No. 768,802

Int. Cl.² G01N *3/00*

U.S. Cl. 23—259 **15 Claims**

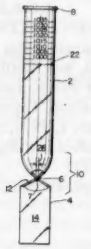
1. A one piece tube and microscope slide manipulative laboratory device for use in clinical procedures employing a test specimen, comprising, in combination;

A. A normally upright tubular reservoir having an open end for receiving the specimen, and a lower end adapted for flow communication from said reservoir, and;

B. A microscope slide chamber comprising closely spaced opposed planar walls of optically transparent material, said chamber having an upper end adapted for flow communication with said chamber, and;

C. A transition member spaced between the lower end of said reservoir and the upper end of said slide chamber, said transition member having a bore for flow communi-

cation and a wall thickness defining a frangible section, between said reservoir and said slide chamber, whereby said device is operable to allow a specimen within said



reservoir to be centrifuged, so that heavier constituents are collected in said slide chamber, which then may be frangibly separated from said reservoir.

4,066,415

GAS GENERATOR FOR INFLATABLE LIFE RAFT

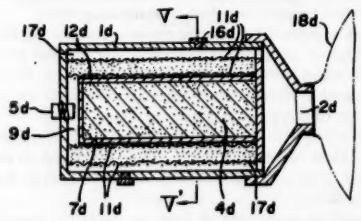
Tsuneo Kasama; Makoto Wada; Masakatu Sano, and Shinzo Tsuji, all of Kawagoe, Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Feb. 2, 1976, Ser. No. 654,347

Claims priority, application Japan, Feb. 3, 1975, 50-14079; Feb. 28, 1975, 50-27377[U]

Int. Cl.² B01J *7/00;* **B63C** *9/16;* **C09K** *3/00;* **F23Q** *1/02*

U.S. Cl. 23—281 **17 Claims**



1. A gas generator for inflating inflatable objects, comprising: an elongated casing having a gas outlet at one longitudinal end thereof and adapted to be connected to an inflatable object, means in said casing defining an elongated central gas-generating chamber containing a gas-generating composition which generates gas by combustion or thermal decomposition and an igniter for igniting said gas-generating composition, means in said casing defining an elongated annular second chamber encircling said gas-generating chamber and connected in series gas flow relationship between said gas-generating chamber and said gas outlet, said second chamber being in radial gas flow communication with said gas-generating chamber and containing either a bed of an endothermically decomposable substance adapted to chemically cool the gas generated in said gas-generating chamber or a bed of a solid physically cooling and filtering substance for physically cooling and filtering said gas or serially arranged beds of both of said substances, said casing having means defining an elongated annular gas flow passage surrounding said second chamber and connected in series gas flow relationship between said second chamber and said gas outlet, and pressure relief valve means mounted on said casing and connected in said gas flow passage and adapted to be opened to place the gas flow passage in communication with the ambient atmosphere when the pressure of the cooled gas flowing through said gas flow passage into said gas outlet exceeds a predetermined value, said gas outlet being a converging nozzle mounted on said casing adjacent one axial end of said gas flow passage.

4,066,416

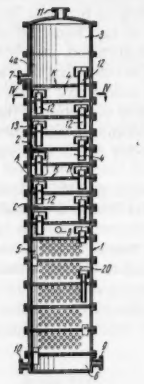
CARBONATING TOWER FOR PRODUCING SODIUM BICARBONATE MAGMA

Vadim Ivanovich Panov, ulitsa Dzerzhinskogo, 17, kv. 10; Grigory Anatolievich Tkach, ulitsa Frunze, 15, kv. 8; Viktor Mikhailovich Tomenko, ulitsa Kombainovskaya, 13/15, kv. 3, all of Kharkov; Boris Mikhailovich Zolotukhin, ulitsa Kalinina, 11, kv. 19, Krasnoperekopsk Krymskoi oblasti, and Erik Konstantinovich Belyaev, Saltovskoe shosse, 157, kv. 128, Kharkov, all of U.S.S.R.

Filed Mar. 30, 1976, Ser. No. 671,812

Int. Cl.² B01D *9/02;* **C01D** *7/10*

U.S. Cl. 23—283 **3 Claims**



1. A carbonating tower for the production of sodium bicarbonate magma containing solid crystalline phase, comprising: a casing having an inner space; pipes for feeding reactants into and for removing the resultant magma and gas from said casing; perforated plates arranged one above another in the inner space of said casing to divide said inner space of the casing into a separation compartment and reaction compartments arranged one above another below said separation compartment; means for cooling the suspension accommodated in at least one of the lower reaction compartments; overflow pipes mounted on said perforated plates and establishing communication of said separation and said reaction compartments, each of said perforated plates having solid portions adjacent to the overflow pipe; an annular baffle adapted to define a zone for accumulation of solid crystalline phase in the magma, said baffle being connected in each reaction compartment to the upper end of said overflow pipe coaxially therewith and in spaced relation thereto, said baffle encircling said overflow pipe and having a lower edge located above the level of the perforated plate and below the upper end of said pipe and forming an annular space with the overflow pipe and means for removing the magma containing solid crystalline phase accumulated therein which means is arranged in proximity with said overflow pipe and adjacent said baffle and substantially below the lower edge of said baffle.

4,066,417

SOLID-FLUID CONTACTING APPARATUS

Charles A. Drake, and Glyndal D. Cowan, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 4, 1976, Ser. No. 682,933

Int. Cl.² B01J *8/00;* **B67D** *5/58*

U.S. Cl. 23—289 **1 Claim**

1. A system for contacting solid particles with at least two

batches of liquid without removing solid particles contained therein comprising, in combination:

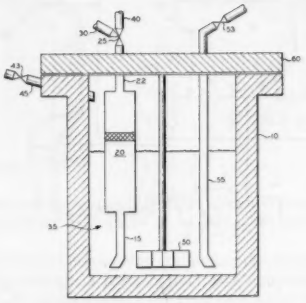
an enclosed vessel adapted for holding liquids and solid particles within said vessel;

a conduit extending through the top of said vessel and terminating near the bottom of said vessel below the level of the liquid in said vessel when a reaction is progressing within said vessel;

a first means connected externally of the vessel to said conduit for introducing a liquid into the vessel through said conduit;

a second means connected externally of the vessel to said conduit for withdrawing through said conduit the liquid that has been contacted with solid particles;

filtering means within said conduit for preventing solid particles carried by the liquid from being withdrawn from



the vessel, solid particles that are retained by, or embedded in, the filter means when liquid is withdrawn being dislodged therefrom and carried back into the contacting zone of the vessel by the subsequent batch of liquid introduced by the first means;

a second conduit having no filtering means and extending through the top of the vessel and terminating near the bottom of the vessel in order to charge or remove the solid particles therethrough;

a mechanical stirrer extending through the top of the vessel and to such a point near the bottom of the vessel that the liquid may be stirred in order to improve the contact between the liquid and the solid particles; and

a passageway extending through the sidewall and above the level of the liquid in said vessel with means to add pressurizing gas to the vessel.

4,066,418

METHOD OF SEALING AN INTERCELL CONNECTION IN A MULTI-CELL ELECTRIC STORAGE BATTERY

Edward Adderley, Hadfield, England, assignor to Sociedad Espanola Del Acumulador Tudor S.A., Madrid, Spain

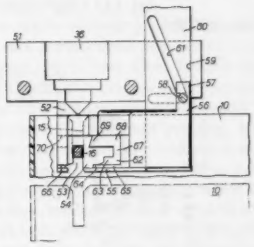
Filed Mar. 28, 1975, Ser. No. 562,943

Claims priority, application United Kingdom, Jan. 21, 1975, 2657/75

Int. Cl.² H01M *2/24, 6/02;* **B29C** *6/04*

U.S. Cl. 29—623.5 **8 Claims**

1. In a method of sealing an intercell connection in a multicell electric storage battery in which the plates of neighboring cells are connected by a connector bar passing through an opening in the upper part of an intercell partition, which comprises placing over the intercell connector bar a mould in the form of a single moulding head and having a marginal portion fitting against each face of the partition and defining a moulding cavity surrounding the bar on each side of the partition, the mould comprising two halves, lying on opposite sides of the partition and each half comprising a body which forms one side wall of the cavity positioned against one side of the bar and on the opposite side of the bar provides guides for a closure member which is capable of moving substantially horizontally to closed position to completely surround the remaining sides of the bar, introducing into the mould a plastics material which is compatible with the partition so as to seal the gap between the margins of the opening and the connector bar, moving the closure member to an open position, and moving



the sealed intercell connection downwardly relative to and out of the mould, the improvement comprising a cutter being provided on the end of the top portion of the closure member, moving the closure to a closed position and thereby gouging a groove in an upper surface of the bar so as to close the cavity throughout the whole width of the upper surface of the bar.

4,066,419

GASOLINE COMPOSITIONS

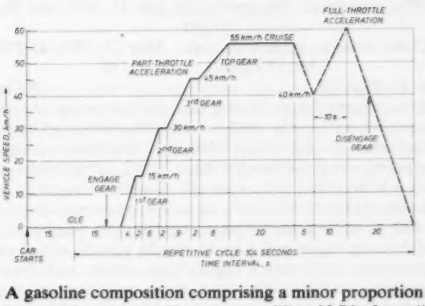
David G. Wharton, Upton-by-Chester, England, assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 8, 1976, Ser. No. 740,170

Claims priority, application United Kingdom, Dec. 19, 1975, 52100/75

Int. Cl.² C10L *1/26*

U.S. Cl. 44—72 **9 Claims**



1. A gasoline composition comprising a minor proportion of gasoline and from about 60 parts per million N/V of gasoline of compound having the formula:

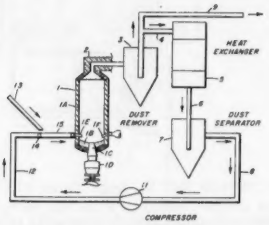
$$[R_f(CH_2)_qSO_2N(R)R_1O]_mPX_{3-m}$$

wherein R_f is a perfluorinated radical selected from the group consisting of aliphatic C_nF_{2n+1} and cycloaliphatic C_nF_{2n-1}, n is an integer from 1 – 18, q is 0 or an integer from 1 to 18, R is hydrogen or an alkyl radical having from 1 to 12 carbon atoms, R_1 is an alkylene bridging radical having from 2 to 12 carbon atoms, m is 1 or 2, and X is chlorine, hydroxyl, —OMe where Me is a metal, or a residual moiety of an active hydrogen-containing organic compound.

4,066,420
PROCESS FOR THE GASIFICATION OF SOLID FUELS

Wilhelm Danguillier, Bochum, and Wolfgang Grams, Wanne-Eickel, both of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Continuation-in-part of Ser. No. 684,112, May 7, 1976, abandoned. This application Mar. 4, 1977, Ser. No. 774,466
Int. Cl.[2] C10J *1/00*
U.S. Cl. 48—197 R 11 Claims



1. A process for the gasification of pulverized or fine-grain coal which is introduced as a mixture with a gaseous agent consisting essentially of CO, H_2 and CO_2 in a slag bath generator, said process including the steps of combining said gaseous agent with said coal to form a mixture, introducing said mixture into a slag bath generator, gasifying the coal in the presence of introduced gasifying medium and of included ash in the coal in said generator at a temperature of between 1500° C and 2200° C, withdrawing liquid slag from said slag bath generator, and using a portion of the combustible gas generated by said slag bath generator as said gaseous agent.

4,066,421
PROCESS FOR PRODUCING HIGH CALORIFIC VALUE FUEL GAS

Kaichiro Yamaguchi, Nishinomiya, and Susumu Iguchi, Sakai, both of Japan, assignors to Osaka Gas Co. Ltd., Osaka, Japan

Continuation of Ser. No. 605,429, Aug. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 254,647, May 18, 1972, abandoned. This application Apr. 14, 1977, Ser. No. 787,311
Claims priority, application Japan, May 28, 1971, 46-37238
Int. Cl.[2] C10G *13/04, 13/30*
U.S. Cl. 48—213 9 Claims

1. A process for producing fuel gas containing as a main component methane in combination with ethane and having a calorific value of more than 9,500 Kcal/Nm^3 which comprises contacting a hydrocarbon having at least 3 carbon atoms and a boiling point of not more than 150° C with hydrogen in gaseous phase in the presence of a catalyst at a temperature of 150° to 400° C, said catalyst comprising 10 to 70 weight percent molybdenum oxide and 3 to 15 weight percent nickel oxide respectively supported on γ-alumina carrier said percents being based on the weight of the carrier, and the proportion of said nickel oxide being in the range of 9 to 60 weight percent, based on the weight of the molybdenum oxide.

4,066,422
WEAR-RESISTANT COMPOSITE MATERIAL AND METHOD OF MAKING AN ARTICLE THEREOF

Lowell J. Moen, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

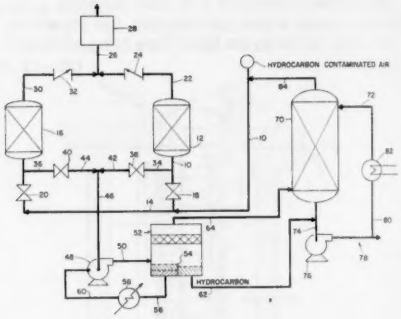
Filed Oct. 2, 1975, Ser. No. 618,854
Int. Cl.[2] B24D *3/08*
U.S. Cl. 51—309 R 10 Claims

1. A wear-resistant composite material comprising a plurality of abrasive-resistant particles embedded in a matrix consisting essentially of about 3 to 5 percent boron, and the balance being iron having residual impurities.

4,066,423
ADSORPTION-ABSORPTION VAPOR RECOVERY SYSTEM

James C. McGill, and William N. Scott, both of Tulsa, Okla., assignors to HT Management Company, Tulsa, Okla.

Filed Sept. 27, 1976, Ser. No. 726,822
Int. Cl.[2] B01D *53/04*
U.S. Cl. 55—48 5 Claims



2. A process for recovering hydrocarbon from an air-hydrocarbon mixture, comprising:

passing the air-hydrocarbon mixture through a solid adsorbent bed at slightly above atmospheric pressure, which bed is capable of selectively adsorbing the hydrocarbon components from the mixture to leave substantially hydrocarbon free air;

venting the substantially hydrocarbon free air to the atmosphere;

subjecting the hydrocarbon laden solid adsorbent bed to a near vacuum with a liquid ring vacuum pump to desorb the hydrocarbon components therefrom and produce a rich air-hydrocarbon vapor mixture containing a liquid from the liquid ring vacuum pump and a recovered liquid hydrocarbon;

separating the liquid from the liquid ring vacuum pump and the recovered liquid hydrocarbon from the rich air-hydrocarbon vapor mixture;

absorbing substantially all of the hydrocarbon components from the rich air-hydrocarbon vapor mixture with recovered liquid hydrocarbon absorbent in an absorber operating with a sufficiently high L/V ratio to produce a constant composition absorber overhead gas and a recovered liquid hydrocarbon mixed with said absorbent;

recycling the absorber overhead gas from the absorption step to a second solid adsorbent bed, capable of selectively absorbing the hydrocarbon therein to leave a substantially free hydrocarbon recycle air;

venting the substantially free hydrocarbon recycle air to the atmosphere;

separating the liquid ring vacuum pump liquid from the recovered liquid hydrocarbon produced in the separation step;

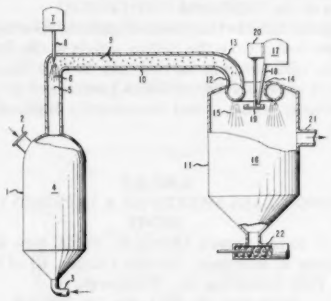
cooling the liquid ring vacuum pump liquid; and

recycling said liquid ring vacuum pump liquid for use in the liquid ring vacuum pump.

4,066,424
SELECTIVELY RECOVERING METAL CHLORIDES FROM GASEOUS EFFLUENT

Arnold William Kilgren; David Nicholson Low, and Robert Warwick Porter, all of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 13, 1976, Ser. No. 732,284
Int. Cl.[2] B01D *7/02*; C01G *9/02*
U.S. Cl. 55—71 7 Claims



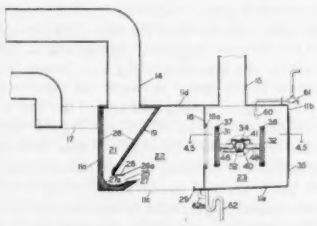
1. In a process for recovering metal chlorides from a gaseous mixture consisting essentially of at least two gaseous metal chlorides,

the improvement comprising contacting the gaseous mixture flowing through a transfer duct at a temperature above the condensation point of the gaseous mixture with at least one stream of liquid to rapidly cool substantially all of the gaseous mixture to a temperature below the freezing point of at least one of the metal chlorides in the gaseous mixture, the velocity of the gaseous mixture being at least the pneumatic conveyance velocity at the contact zone and the rate of cooling substantially all of the gaseous mixture being less than one second.

4,066,425
VENTILATING APPARATUS INCLUDING EXHAUST FILTER EXCHANGER

Louis A. Nett, P.O. Box 199N, R.R. No. 1, Cambridge, Wis. 53523

Filed Aug. 30, 1976, Ser. No. 718,842
Int. Cl.[2] B01D *35/02*
U.S. Cl. 55—242 4 Claims



1. Ventilating apparatus, comprising:

a. an exhaust hood having a fume collection chamber, an exhaust chamber, and an interior wall between said chambers having an opening therein to allow fumes to pass from said collection chamber to said exhaust chamber;

b. a filter exchange assembly having a pair of movable filter holders each for holding at least one filter selectively in operating position across said opening and in reserve position within said exhaust chamber; and

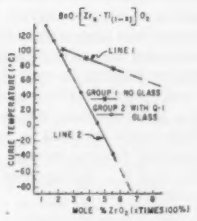
c. means for moving said filter holders for alternatively positioning one of said filter holders in operating position while the other is in reserve position, said means for moving said filter holders having:

1. a rotatable central shaft member mounted to said exhaust hood for rotation in said exhaust chamber;
2. means for movably mounting said filter holders to said central shaft member for retraction of said filter holders toward said central shaft member and extension away therefrom; and
3. means for selectively extending said filter holders outwardly from said central shaft member to an extended position wherein one of said filter holders may be in operating position in said interior wall opening and for retracting said filter holders inwardly toward said central shaft member to a retracted position, whereby a filter held by the one of said filter holders in the operating position may be exchanged with a filter held by the other if said filter holders in a reserve position by retraction of said filter holders to their retracted position, rotation of said central shaft member to interchange the positions of said filter holders, and extension of said filter holders to their extended position wherein the other of said filter holders is in the operating position.

4,066,426
METHOD OF FORMING A GLASS-REACTED-CERAMIC WITH CADMIUM

Galeb H. Maher, North Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Continuation-in-part of Ser. No. 690,225, May 26, 1976, abandoned. This application Nov. 1, 1976, Ser. No. 737,869
Int. Cl.[2] C03C *21/00*
U.S. Cl. 65—18 12 Claims



1. A method for making a glass-reacted-ceramic body comprising mixing a major proportion of a finely ground ceramic comprised of barium titanate and an alkaline-earth-metal zirconate and a minor proportion of a pulverized low temperature glass; forming a cake of said mixture; placing a quantity of cadmium oxide powder adjacent to said cake; and firing said cake and said cadmium oxide powder at a temperature of between 1600° F to 2050° F so that said cadmium oxide powder provides during said firing a controlled and enriched cadmium atmosphere external of said cake to transform said cake during said firing into a sintered body and to cause cadmium ions from said cadmium of said atmosphere to react with said ceramic and to diffuse into the titanate lattice thereof, whereby grain growth in said body is enhanced and the Curie temperature of said body is shifted downwardly.

11. A method for making a glass-reacted-ceramic body comprising mixing a major proportion of a finely ground ceramic comprised of barium titanate and an alkaline-earth-metal zirconate and a minor proportion of a pulverized low temperature glass; forming layers of said glass-ceramic mixture; coating said layers with an electroding paste, stacking said electroded layers to form a cake; placing a quantity of cadmium oxide powder adjacent to said cake; and firing said cake and said cadmium oxide powder at a temperature of between 1600° and 2050° F so that said cadmium oxide powder provides during said firing a controlled and enriched cadmium atmo-

sphere external of said cake to transform said cake during said firing into a sintered body and to cause cadmium ions from said cadmium of said atmosphere to react with said ceramic and to diffuse into the titanate lattice thereof.

4,066,427

BONDING METHOD USING A SOLDERING GLASS

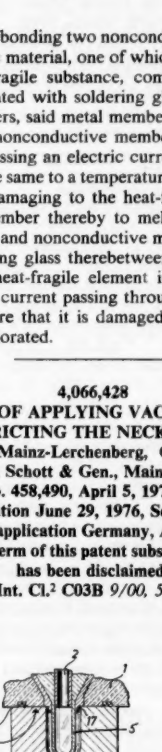
Eizo Goto, Chigasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 579,234, May 20, 1975, abandoned. This application Mar. 14, 1977, Ser. No. 777,104

Claims priority, application Japan, May 20, 1974, 49-56416; July 11, 1974, 49-79427

Int. Cl.² C03B 23/20

U.S. Cl. 65—40 **10 Claims**



1. A method for bonding two nonconductive members made of glass or ceramic material, one of which includes an element made of a heat-fragile substance, comprising interposing a metal member coated with soldering glass between the nonconductive members, said metal member being out of contact with at least the nonconductive member including the heat-fragile element, passing an electric current through the metal member to heat the same to a temperature which is higher than the temperature damaging to the heat-fragile element of the nonconductive member thereby to melt the soldering glass, pressing the metal and nonconductive members together with the molten soldering glass therebetween cooling these members before said heat-fragile element is heated by the heat resulting from the current passing through the metal member to such temperature that it is damaged or has its properties substantially deteriorated.

4,066,428

METHOD OF APPLYING VACUUM WHILE CONSTRICTING THE NECK PORTION

Franz Gunthner, Mainz-Lerchenberg, Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Germany

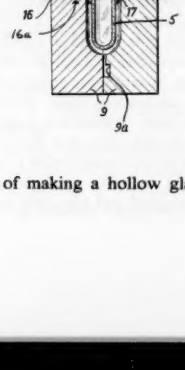
Division of Ser. No. 458,490, April 5, 1974, Pat. No. 3,967,947. This application June 29, 1976, Ser. No. 700,948

Claims priority, application Germany, Apr. 11, 1973, 2318116

The portion of the term of this patent subsequent to July 6, 1993, has been disclaimed.

Int. Cl.² C03B 9/00, 5/30

U.S. Cl. 65—66 **10 Claims**



1. Method of making a hollow glass article, which comprises:

a. discharging molten glass from a feeder in the form of a tube closed at one end, into a finishing mold,

b. applying a pressure differential between the interior of the tube and the exterior thereof within the mold by aspiration of the mold to apply a vacuum between the tube and the mold for shaping of the molten glass into the hollow article in the mold,

c. lowering of the mold relative to the feeder while the glass between the feeder and mold is still molten so that a neck forms interconnecting the hollow article in the mold and glass in the feeder, and

d. with the mold in the lowered position, severing the glass in the feeder from the hollow article in the mold at said neck, said severing leaving the hollow article with a closed upwardly disposed neck portion and the glass from the feeder with a closed downwardly disposed neck portion.

4,066,429

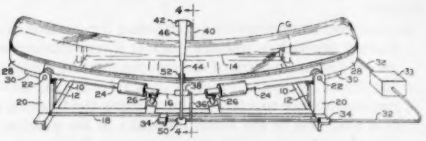
BENDING GLASS SHEETS TO A TAPERED LINE OF BEND

Thomas J. Reese, Sarver; Melvin W. Tobin, New Kensington, and James R. Mortimer, Natrona Heights, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 20, 1977, Ser. No. 799,045

Int. Cl.² C03B 23/02

U.S. Cl. 65—107 **13 Claims**



1. A method of bending a glass sheet along a line of bending that has a creased appearance at a first end and a gently bent, uncreased appearance at a second end, comprising:

supporting a flat glass sheet on an outline bending mold provided with an upper shaping surface conforming in elevation to the desired contour for the bent glass sheet; supporting a ribbon of electroconductive material above the upper surface of the glass sheet in vertical alignment with said line of bending; heating the glass sheet to near its softening point; passing electric current through said electroconductive ribbon so as to heat said line of bending to a temperature higher than that of the remainder of the sheet, whereby the glass sheet bends along said line of bending and sags into conformity with the contour of the bending mold; and as the glass sags, increasing the space between the electroconductive ribbon and the glass at said second end of the line of bending to a greater degree than any increase in the space between the electroconductive ribbon and the glass at said first end of the line of bending, so that at the conclusion of the bending the space at said first end is smaller than the space at said second end.

9. An apparatus for bending a glass sheet along a line of bending that has a creased appearance in one portion and a gently bent uncreased appearance in another portion comprising: a frame supporting an outline bending mold which includes a pair of shaping rails extending along opposite sides of the mold, one of said rails having an upper surface provided with a "V" shaped configuration, and the other shaping rail provided with an upper surface of gently curvature, the upper extremities of said shaping rails defining a substantially horizontal support plane for a sheet of flat glass to be bent; a pair of electrodes supported on said frame on opposite sides of the mold, spaced laterally outward from said shaping rails, said electrodes having means for supporting a ribbon of electroconductive material above said shaping rails in vertical alignment with the "V" in said one shaping rail, the first of said electrodes

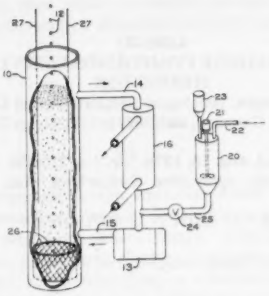
being located adjacent said gently curved shaping rail and having its ribbon supporting means at an elevation above said glass support plane, the second of said electrodes being located adjacent the "V" shaped shaping rail and having its ribbon supporting means at an elevation below said glass support plane; and means for maintaining said ribbon in tension between said electrodes.

4,066,430

METHOD OF TEMPERING IN A FLUIDIZED QUENCHING MEDIUM

Helmut Franz, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 26, 1976, Ser. No. 745,279
Int. Cl.² C03B 27/00
U.S. Cl. 65—116 **21 Claims**



1. A method of quenching a heated article comprising contacting the article with a fluidized dispersion of water in hydrophobic colloidal silica having a temperature lower than that of said heated article and maintaining said contact for a sufficient period of time to reduce the temperature difference between said heated article and said fluidized dispersion.

4,066,431

SYNTHETIC N-RELEASING SOIL CONDITIONER

Daniel Martin Ennis, 3416 Tulane Drive, No. 12, Hyattsville, Md. 20783

Filed Sept. 19, 1975, Ser. No. 615,121
Int. Cl.² C05C 11/00
U.S. Cl. 71—27 **11 Claims**

1. The method of improving soil structure which consists of applying an aqueous solution of hexamethylenediamine adipate to clay-containing soil in an amount which is the equivalent of at least about 0.005% of oven-dried clay-containing soil particles of a size less than 0.25 millimeters and which is effective to achieve said structure improvement.

4,066,432

PRODUCTION OF SUSPENSION FERTILIZERS FROM WET-PROCESS ORTHOPHOSPHORIC ACIDS

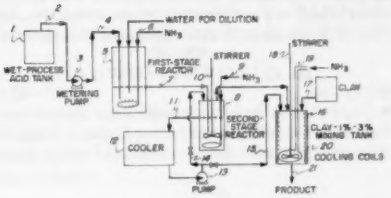
Thomas M. Jones, Sheffield, Ala., assignor to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation-in-part of Ser. No. 702,209, July 2, 1976, now Defensive Publication No. T959,001. This application Jan. 28, 1977, Ser. No. 763,423
Int. Cl.² C05B 7/00
U.S. Cl. 71—34 **6 Claims**

1. A process for the production of stable suspension-type fertilizers from wet-process orthophosphoric acid, which suspensions have unusually high plant food contents of upwards to about 14 percent nitrogen by weight and upwards to about 41 percent phosphorus by weight, said phosphorus expressed as P_2O_5 and said P_2O_5 being present therein as substantially 100 percent orthophosphate and containing the congeneric impurities originally present in said wet-process acid, excellent flow properties within the pourability expressed as percent of total volume is substantially 100 percent, and unusually low viscosities in the range of approximately 500–1000 cP at 80° F, said pourability and said viscosities effective both (a) after storage for up to about 90 days at about 100° F, and (b) after exposure to substantial vibration equivalent to that experienced in railroad tank cars and the like traveling distances in excess of 50 miles, which process comprises the steps of:

1. simultaneously adding a stream of ammonia, a stream of water, and a stream of merchant-grade orthophosphoric acid of the wet-process type to a first reactor; controlling the portion of ammonia added relative to said merchant-grade wet-process phosphoric acid in said first reactor to continuously produce an $N:P_2O_5$ mole ratio therein in the range from about 0.20 to about 0.25;

removing at least a portion of the resulting partially ammoniated mechant-grade wet-process phosphoric acid material from said first reactor and introducing said removed material as a stream into a second reactor; simultaneously introducing into said second reactor together with said



PRODUCTION OF AMMONIUM PHOSPHATE SUSPENSION FERTILIZERS BY A TWO-STAGE CONTINUOUS AMMONIATION PROCESS

stream of material from said first reactor a stream of ammonia; controlling the portion of ammonia added to said second reactor to produce an $N:P_2O_5$ mole ratio in the range from about 0.27 to about 0.34;

3. removing at least a portion of the resulting further partially ammoniated merchant-grade wet-process phosphoric acid material from said second reactor and introducing said removed material as a stream into a third reactor; simultaneously introducing into said third reactor, together with said stream of material from said second reactor, a stream of ammonia together with small amounts of gelling type clay; controlling the portion of ammonia added to said third reactor to reduce the $N:P_2O_5$ ratio therein in the range from about 0.34 to about 0.37; and
4. removing from said third reactor the resulting stable suspension characterized by the plant-food content, flow properties, and viscosities set forth supra, and further characterized by the fact that substantially 100 percent of the phosphate values therein are of the ortho type and are derived from wet-process acid.

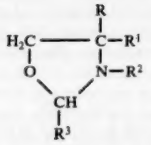
4,066,433

METHOD OF CONTROLLING THE GROWTH OF BACTERIA, FUNGI AND ALGAE USING MEMBERS OF THE CLASS OF OXAZOLIDINES

Jerry H. Hunsucker, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Division of Ser. No. 469,200, May 13, 1974. This application June 20, 1975, Ser. No. 588,744
Int. Cl.² A01N 9/00, 9/22, 9/28
U.S. Cl. 71—67 **6 Claims**

1. A method of controlling the growth of bacteria, fungi, green and blue green algae and Newcastle's and Boney viruses by applying to these organisms or to the environment inhabited by them growth-inhibiting amounts of 10 μg/ml to 1000 μg/ml of an oxazolidine represented by the formula:



where R and R^1 are hydrogen or alkyl of 1 or 2 carbon atoms and can be the same or different; R^2 is alkyl of from 1 to 3 carbon atoms, and R^3 is hydroxyphenyl.

4,066,434

PLANT GROWTH RETARDANT COMPOSITIONS CONTAINING IMINOCARBONYLPHOSPHONATES AND IMINOCARBONYLPHOSPHONATES

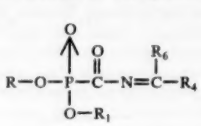
Colin Leslie McIntosh, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 621,731, Oct. 15, 1975, abandoned, which is a continuation-in-part of Ser. No. 527,351, Nov. 26, 1974, abandoned. This application Nov. 2, 1976, Ser. No. 738,167

Int. Cl.² A01N *9/36;* **C07F** *9/40*

U.S. Cl. 71—86 **31 Claims**

1. A plant growth retardant composition comprising: (a) at least one of the following: a surfactant, a solid or liquid diluent; and (b) an effective amount of a compound of the formula:



where

R is alkyl of 1 to 4 carbon atoms or benzyl;

R_1 is Na, K, NH_4, or R;

R_4 is NR_2R_3, or OR_5;

where

R_2 is hydrogen or alkyl of 1 to 12 carbon atoms;

R_3 is hydrogen or alkyl of 1 to 3 carbon atoms; and

R_5 is alkyl of 1 to 3 carbon atoms; and

R_6 is NR_2R_3, hydrogen, or alkyl of 1 to 3 carbon atoms.

4,066,435

PLANT GROWTH REGULATORS

Robert K. Howe, Bridgeton, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 347,519, April 3, 1973. This application Dec. 23, 1976, Ser. No. 753,678

Int. Cl.² A01N *9/36*

U.S. Cl. 71—86 **2 Claims**

1. A method of regulating the natural growth or development of dicotyledonous plants which comprises applying to said plant an effective plant growth regulating amount of m-methoxycarbonylbenzyltributylphosphonium bromide or o-methoxycarbonylbenzyltributylphosphonium chloride.

4,066,436

METHOD OF CONTROLLING SICKLEPOD IN SOYBEANS

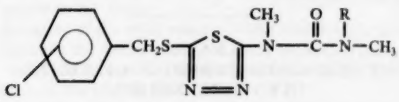
Joel L. Kirkpatrick, Overland Park, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed June 30, 1976, Ser. No. 701,264

Int. Cl.² A01N *9/12*

U.S. Cl. 71—90 **3 Claims**

1. The method of selectively controlling broadleaf weeds in soybean fields comprising applying post-emergently to the plants in said fields an effective amount sufficient to kill weeds, including sicklepod but insufficient to cause substantial permanent injury to soybeans, of a compound having the general structural formula



in which R is hydrogen or methyl, with the additional provision that when the chloro substituent is in the para position on the benzyl structure, R is methyl.

4,066,437

TRIAZOLIDINE COMPOUNDS USEFUL AS HERBICIDES

Brigitta von Bredow, Binningen, Switzerland, and Georg Pissiotas, Lorrach, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

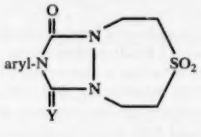
Filed Aug. 18, 1976, Ser. No. 715,354

Claims priority, application Switzerland, Aug. 29, 1975, 11247/75

Int. Cl.² A01N *9/22;* **C07D** *513/04*

U.S. Cl. 71—91 **10 Claims**

1. A 1,2,4-triazolidine compound of formula I



wherein

aryl is unsubstituted naphthyl, or naphthyl or phenyl mono- or di-substituted by halogen, (C_1–C_4) alkyl, (C_1–C_4)alkoxy, (C_1–C_4) alkylthio, (C_2–C_4) alkenyloxy, (C_2–C_4) alkynyloxy, phenoxy, benzyloxy, trifluoromethyl, sulphamoyl, di(C_1–C_4)alkylsulphamoyl, nitro, cyano, thiocyanato, amino, mono- or di(C_1–C_4)alkylamino, di(C_1–C_4)alkylcarbamoyl or (C_1–C_4)alkylsulphonyl, and

Y is oxygen or sulfur.

6. A composition for selectively controlling weeds in crops of cereals, maize, rice and rape-seed, which composition comprises as active substance an effective amount of a compound of formula I, according to claim **1**, together with a suitable carrier therefor.

4,066,438

SUBSTITUTED AMINODI- OR TRIHALOPYRIDINES AND METHOD OF USE

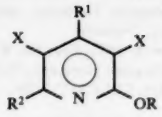
Howard Johnston, Walnut Creek, Calif., and Herman O. Senkbeil, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 571,151, April 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 177,429, Sept. 2, 1971, abandoned, which is a continuation-in-part of Ser. No. 124,571, March 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 40,389, May 25, 1970, abandoned. This application Apr. 12, 1976, Ser. No. 676,035

Int. Cl.² C07D *213/61;* **A01N** *9/22*

U.S. Cl. 71—94 **21 Claims**

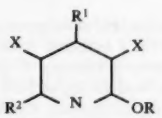
1. A compound corresponding to the formula



and the organic or inorganic acid addition salts thereof, wherein X represents chloro, bromo or fluoro; R^1 represents hydrogen, amino, loweralkylamino, arylamino from the group consisting of phenylamine, benzylamine, phenylethylamine, phenylpropylamine and phenylbutylamine, loweralkylamido or N-(loweralkyl)loweralkylamido; R^2 represents hydrogen, X, amino or loweralkylamino; with the proviso that one of R^1 or R^2 is always amino or loweralkylamino and the other of R^1 or R^2 is other than amino or loweralkylamino; R represents butyl, 2-hydroxypropyl, 4-hydroxybutyl, 6-hydroxyhexyl or the radical

wherein Z represents amino, loweralkylamino, phenylamino, hydroxy, loweralkoxy, aryloxy from the group consisting of phenyloxy, benzyloxy, phenylethoxy, phenylpropoxy and phenylbutoxy, 2-propenyl, hydroxyloweralkoxy, mercapto, loweralkylthio, loweralkanoyloxy or 2-halooweralkanoyloxy and R^3 represents hydrogen or methyl and with the proviso that R is other than butyl when R^2 is X.

12. A method for controlling the growth of undesirable plant species which comprises applying to plants, plant parts or their habitats a growth inhibiting amount of at least one pyridine compound corresponding to the formula



and the organic or inorganic acid addition salts thereof, wherein X represents chloro, bromo or fluoro; R^1 represents hydrogen, amino, loweralkylamino, arylamino from the group consisting of phenylamine, benzylamine, phenylethylamine, phenylpropylamine and phenylbutylamine, loweralkylamido or N-(loweralkyl)loweralkylamido; R^2 represents hydrogen, X, amino or loweralkylamino; with the proviso that one of R^1 or R^2 is always amino or loweralkylamino and the other of R^1 or R^2 is other than amino or loweralkylamino; R represents butyl, 2-hydroxypropyl, 4-hydroxybutyl, 6-hydroxyhexyl or the radical

wherein Z represents amino, loweralkylamino, phenylamino, hydroxy, loweralkoxy, aryloxy from the group consisting of phenyloxy, benzyloxy, phenylethoxy, phenylpropoxy and phenylbutoxy, 2-propenyl, hydroxyloweralkoxy, mercapto, loweralkylthio, loweralkanoyloxy or 2-halooweralkanoyloxy and R^3 represents hydrogen or methyl and with the proviso that R is other than butyl when R^2 is X.

4,066,439

METHOD OF SELECTIVELY COMBATING WILD OATS

James L. Ahle, Shawnee Mission, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Oct. 23, 1975, Ser. No. 625,233
Int. Cl.² A01N 9/20
U.S. Cl. 71—111 **3 Claims**

1. The method of selectively killing wild oats plants in stages of growth varying from the two-leaf to four-leaf stage in the presence of wheat or barley comprising applying to said wild oats plants an effective amount of a combination of one part of barban, from two to five parts of CIPC and an inert diluent.

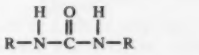
4,066,440

SYMMETRICAL ALKYNYL UREAS

Jay K. Rinehart, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 620,984, Oct. 9, 1975, abandoned, which is a continuation of Ser. No. 383,843, July 30, 1973, abandoned. This application June 30, 1976, Ser. No. 701,398
Int. Cl.² A01N 9/20
U.S. Cl. 71—119 **7 Claims**

1. A method of controlling a weed of the genus Cyperus which comprises contacting the weed with a composition in an amount effective to control the weed, the composition having the general formula:



wherein: R is an alkynyl of from three to five carbon atoms.

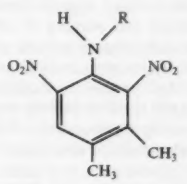
4,066,441

PREEMERGENCE HERBICIDAL METHODS AND COMPOSITIONS USING 2,6-DINITROXYLIDINE COMPOUNDS

Albert William Lutz, Montgomery Township, Somerset County, and Robert Eugene Diehl, Trenton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 323,000, Jan. 12, 1973, Pat. No. 3,920,742, June 14, 1972, which is a continuation-in-part of Ser. No. 262,807, June 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 174,938, Aug. 25, 1971, abandoned. This application Jan. 6, 1975, Ser. No. 538,980
Int. Cl.² A01N 9/20
U.S. Cl. 71—121 **8 Claims**

1. A method for the preemergence control of undesirable plant species comprising applying to soil containing seeds of said undesirable plant species a herbicidally effective amount of a compound of the formula:



wherein R represents 1-ethylbutyl; 1-ethylpropyl; 1-methylpropyl or 1-methylbutyl.

4,066,442

METHOD OF MAKING CHROME STEEL IN AN ELECTRIC ARC FURNACE

Jean Saleil, 11, rue Lougansk, 42100, Saint-Etienne; Maurice Debras, and Jean-Yves Malefant, both of 41, rue Emile Zola, 42240, Unieux, all of France

Filed Jan. 27, 1977, Ser. No. 762,945
Claims priority, application France, Feb. 4, 1976, 76.03077
Int. Cl.[2] C21C *5/52, 5/32*
U.S. Cl. 75—12 7 Claims

1. A method of making chromium steel by decarburizing a charge of chromium-bearing molten metal in an electric furnace, the method including the steps of:

a. introducing a double lance consisting of two concentric tubes into said furnace through an opening in the wall of said furnace or in the roof of said furnace,

b. submerging the tip of said lance in said molten charge,

c. blowing pure oxygen and water vapor through said lance in a jet into said molten charge, so that the peripheral part of said jet includes more than 80% of the water vapor which is blown in through the gap between said two tubes of said lance to protect the tip of said lance against high-temperature wear, the inner tube of said lance carrying a blown mixture of pure oxygen and water vapor,

d. decreasing the relative amount of the pure oxygen and increasing that of the water vapor as the carbon content of said molten metal decreases,

e. when the carbon level in said molten metal is below 1%, regulating continuously the proportion of water vapor in said blown mixture and the amount of cooling additives so that the temperature of said molten metal is maintained between 1650° C. and 1720° C.

4,066,443

PROCESS OF STABILIZING THE OPERATION OF BLAST FURNACES FOR PRODUCING MOLTEN IRON

James W. Currier, Palatine, Ill., assignor to International Minerals and Chemical Corporation, Libertyville, Ill.

Filed Sept. 30, 1975, Ser. No. 618,144
Int. Cl.[2] C21B *5/00*
U.S. Cl. 75—41 8 Claims

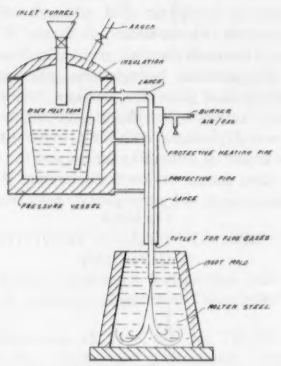
1. In a process of preparing molten iron in a blast furnace in which the alkali loading to the furnace is at least about 4 pounds of alkali oxides per ton of metal produced, the alkai metal content in the furnace slag fluctuates widely due to repetitive accumulation and purging of alkali metals in the furnace over extended operating periods with corresponding fluctuations in the sulfur content and temperature of the molten metal, and the MgO content in the furnace slag is in the range of from about 6% to about 18% by weight, the improvement comprising adding olivine to the furnace charge on a substantially continuous basis at an average rate of about 10 to about 100 pounds of olivine per ton of molten iron produced in the furnace to effect the continuous removal of the alkali metals from the furnace in the furnace slag and thereby stabilize the furnace operation.

4,066,444

PROCESS FOR DEOXIDIZING STEEL BY MEANS OF MOLTEN ALUMINUM

Hans Kosmider, St. Magnus, Germany, assignor to Klockner-Werke AG, Duisburg, Germany

Filed Nov. 1, 1975, Ser. No. 630,664
Claims priority, application Germany, Nov. 9, 1974, 2453254
Int. Cl.[2] C21C *7/06*
U.S. Cl. 75—58 15 Claims



4. The improvement of claim 3 wherein the inert gases are argon or nitrogen.

4,066,445

PROCESS FOR PRODUCING MAGNESIUM UTILIZING ALUMINUM METAL REDUCTANT

James D. Johnston; Robert N. Sanders, and James M. Wood, Jr., all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 610,430, Sept. 4, 1975, Pat. No. 4,033,759. This application Feb. 28, 1977, Ser. No. 772,652
Int. Cl.[2] C22B *45/00*
U.S. Cl. 75—67 R 19 Claims

1. A process for production of magnesium in a reaction-condensation system having a reducing furnace zone and a condensation zone, comprising reacting in the reducing furnace zone aluminum metal containing at least 80 weight percent aluminum and a calcium magnesium aluminate slag or magnesium oxide in the presence of said slag containing not more than five weight percent silicon dioxide, the amount of aluminum metal fed into the reducing furnace zone being in excess of the stoichiometric amount of aluminum required to react with the magnesium oxide fed into the reaction zone, and slag removed therefrom contains about 6–16 weight percent magnesium oxide, carrying out the reaction at a temperature of about 1500°–1700° C at a pressure of about 0.5–2.0 atmospheres, maintaining the silicon dioxide content and the magnesium oxide content of the molten oxidic slag in the reaction zone at least as low as five weight percent and about 6–16 weight percent, respectively, evolving magnesium vapor from the reaction zone to the condensation zone, and condensing and recovering the magnesium as a product.

4,066,446

THERMALLY BLOATED FIRECLAY (SCR VERILITE) LADLE INSULATION

George L. Peck, Pittsburgh, Pa., assignor to General Refractories Company, Bala Cynwyd, Pa.

Filed July 8, 1976, Ser. No. 703,611
Int. Cl.[2] C22B *9/10;* C04B *31/00*
U.S. Cl. 75—96 15 Claims

1. The method of treating molten metal which comprises applying to the exposed surface of molten metal a thermally

insulating and protective layer of finely divided particles of a thermally bloated fireclay.

4,066,447

LOW EXPANSION SUPERALLOY

Darrell Franklin Smith, Jr.; Edward Frederick Clatworthy, and Donald Edward Wenschhof, Jr., all of Huntington, W. Va., assignors to Huntington Alloys, Inc., Huntington, W. Va.

Filed July 8, 1976, Ser. No. 703,528
Int. Cl.[2] C22C *19/05, 30/00, 38/06, 38/48*
U.S. Cl. 75—122 10 Claims

1. An alloy consisting essentially of 30% to 57% nickel, 1.7% to 8.3% chromium, 1 to 2% titanium, metal from the group columbium, tantalum and mixtures thereof in proportions providing the total percentage of columbium plus one-half the percentage of tantalum is 1.5 to 5%, up to 31% cobalt, up to 1.5% aluminum, up to 0.2% carbon, up to about 2% manganese, up to about 1% silicon, up to 0.03% boron and balance essentially iron in an amount of at least 34% of the alloy and having the composition proportioned in accordance with the following four relationships A, B, C′ and D′ whereby:

A. $\%Ni+0.88(\%Co)-1.70(\%Al)-2.01(\%Ti)+0.26(\%Mn+\%\ Cr)$ equal up to 51.8

B. $\%Ni+1.13(\%Co)-2.69(\%Al)-1.47(-\%Ti)-1.93(\%Mn)-\ 2.51(\%Cr)+1.87(\sqrt{\%Cr})$ at least 40.8

C. $\%Al+1.3(\%Ti)+1.44(\%Cb+\frac{1}{2}\%Ta)-0.12(\%Cb+\frac{1}{2}\lambda\%Ta)^2-\ 0.37(\%Cr)+0.03(\%Cr)^2$ at least 3.81

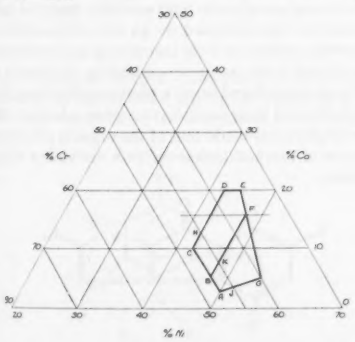
D. $\%Al+1.3(\%Ti)+0.25(\%Cb+\frac{1}{2}\%\ Ta)-0.125(\%Cr)$ up to 3.18

4,066,448

NICKEL-CHROMIUM-COBALT CONTAINING ALLOYS

Ronald Mason Haeberle, Jr., Huntington, W. Va., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Apr. 7, 1976, Ser. No. 674,568
Int. Cl.[2] C22C *19/05*
U.S. Cl. 75—171 8 Claims



8. An alloy consisting essentially of 35 to 47.5% chromium, about 42.5% to 55% nickel, about 2.5 to 21% cobalt, titanium present to improve workability or tie up nitrogen up to 1.5%, up to 0.25% carbon, and up to 2% aluminum, the chromium, nickel and cobalt being correlated to represent a point within the area ACDEGA of the accompanying drawing.

4,066,449

METHOD FOR PROCESSING AND DENSIFYING METAL POWDER

Charles J. Havel, 162 Proctor, Utica, N.Y. 13501

Division of Ser. No. 509,723, Sept. 26, 1974, abandoned. This application Aug. 6, 1975, Ser. No. 602,221
Int. Cl.[2] B22F *1/00*
U.S. Cl. 75—211 8 Claims

1. A method for producing a substantially fully dense compact from prealloyed powder metal comprising the steps of

a. providing a fully alloyed powder of predetermined composition,

b. cold working the particles of the prealloyed powder metal to introduce an amount of strain equivalent to at least about a forty percent reduction in size along a major axis of the particle to thereby lower the recrystallization temperature of the powder metal, said cold working being carried out at an energy level less than that which will cause extensive brittle fracture of the particles to maintain the integrity of the particles,

c. maintaining the powder metal at a temperature below the lowered recrystallization temperature until the powder is to be consolidated and thereafter

d. hot consolidating the powder metal by heating the powder metal to a temperature at least slightly above the lowered recrystallization temperature to recrystallize the powder metal, but below that at which excessive grain growth occurs to maintain a relatively small grain size in the compact and by applying pressure to the heated powder metal.

4,066,450

METAL BODY HAVING LARGE SURFACE AREA AND PROCESS FOR PRODUCING SAME

Masaharu Takeuchi; Isemi Igarashi, both of Nagoya, and Tsuchio Bunda, Okazaki, all of Japan, assignors to Kabushiki Kaisha Toyota Cho Kenkyusho, Japan

Filed Nov. 24, 1975, Ser. No. 634,646
Claims priority, application Japan, Nov. 26, 1974, 49-136461
Int. Cl.[2] C22C *1/09*
U.S. Cl. 75—229 17 Claims

1. A coated bed or stratum of entangled metal fibers wherein the coated bed has a large surface area and high porosity, the coated bed comprising:

a. a coating of metal selected from the group consisting of aluminum and aluminum alloy and

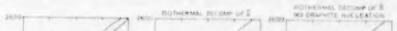
b. fibers of metal which has a higher melting point than that of the coating,

the coating having rough and complex surfaces with a plurality of spaces, cracks, irregularities and flake or plate-shaped portions, and the metal fibers being coated over their entire surfaces with said coating.

4,066,451
CARBIDE COMPOSITIONS FOR WEAR-RESISTANT FACINGS AND METHOD OF FABRICATION

Erwin Rudy, 15750 NW. Oak Hills Drive, Beaverton, Oreg. 97005

Filed Feb. 17, 1976, Ser. No. 658,346
Int. Cl.[2] B22F *3/00*; C22C *29/00*
U.S. Cl. 75—240 6 Claims

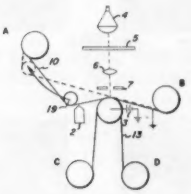


1. A metal carbide composition $(Mo_xW_{x'}Cr_{x''})C_z$, in which the relative mole fractions x, x', x'' ($x + x' + x'' = 1$) of the metal components assume values of at least 0.20 for x, between 0 and 0.80 for x', and between 0 and 0.18 for x'', when x is less than about 0.80 and is 0 when x is greater than about 0.80, and the value of the stoichiometry parameter z, which stands for the number of gramatoms carbon present per gramatom of the metal component in the carbide alloy, lies between 0.60 and 0.73, said metal carbide composition being a two-phased mixture consisting of metal subcarbide, M_2C and hexagonal monocarbide, MC, solid solution, wherein M represents the metal component, the average spacing between the grains of said subcarbide and said monocarbide phases in the mixture being less than 4 microns, and said two-phased mixture being formed by solid state decomposition of the pseudocubic $\eta-M_3C_2$, or cubic $\alpha-MC_{1-z}$, high temperature carbide solid solutions.

4,066,452
VELOCITY COMPENSATION FOR BEAD BYPASS

Earl V. Jackson, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 476,187, June 4, 1974, Pat. No. 3,945,724. This application Nov. 5, 1975, Ser. No. 629,196
Int. Cl.[2] G03G *15/00*
U.S. Cl. 96—1 PE 8 Claims



1. A method for removing excess photoelectrophoretic ink developer accumulated as a bead at a nip formed by movably contacting an ink wetted injecting web with a blocking electrode in at least tangential contact in and about an imaging zone without substantially altering the speed of advance of the injecting web, comprising the steps of:

a. disengaging the moving injecting web from the blocking electrode within the imaging zone by moving the axis of at least one movable axially rotatable compensation roller, arranged in biased contact with an unwetted side of the injecting web, along a plane approximately parallel to the injecting web and along an arc approximating part of a fixed elliptical pathway, while simultaneously maintaining a taut condition in the injection web to permit passage of accumulated ink; and thereafter

b. re-engaging the moving injecting web with the blocking electrode by moving the rotatable compensation roller in the opposite direction along a fixed elliptical pathway to the original position for imaging purposes.

4,066,453
PROCESS FOR THE PREPARATION OF PRINTING FORMS

Erwin Lind, Auringen, and Franz Freimuth, Wiesbaden-Biebrich, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 466,069, May 1, 1974, abandoned. This application June 2, 1976, Ser. No. 692,154
Claims priority, application Germany, May 2, 1973, 2322047
Int. Cl.[2] G03G *13/26*
U.S. Cl. 96—1 R 24 Claims

1. In the process for the preparation of printing forms or metallic etchings from electrophotographic or electrographic reproduction materials composed of a support with a photoconductive organic or high-ohmic organic layer thereon, by charging and imagewise exposure, or by imagewise charging, development of the electrostatic image with a finely divided toner, fixing, and removal of the layer in the image-free areas by means of a decoating solution,

the improvement which ccomprises developing the electrostatic image with a developer which chemically reacts at least superfically with the image areas of the photoconductive organic or high-ohmic organic layer at room temperature, thereby simultaneously effecting development and resistance to the decoating solution,

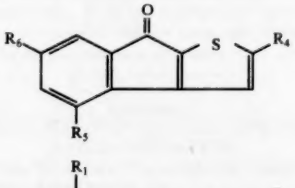
or developing the electrostatic image with a developer which chemically reacts with the decoating solution and thereby deactivates it in the image areas.

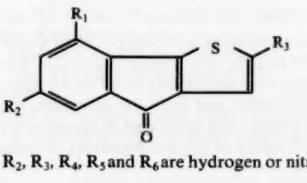
4,066,454
ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING INDENOTHIOPHENONE OR ITS DERIVATIVE AND PROCESS OF PREPARING INDENOTHIOPHENONE AND ITS DERIVATIVE

Mitsuru Hashimoto, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Division of Ser. No. 416,792, Nov. 19, 1973, abandoned. This application Oct. 3, 1975, Ser. No. 619,508
The portion of the term of this patent subsequent to Mar. 18, 1975, has been disclaimed.
Int. Cl.[2] G03G *5/06*
U.S. Cl. 96—1.5 R 4 Claims

1. An electrophotographic light-sensitive material having a photoconductive layer formed on an electroconductive support, the photoconductive layer comprising a photoconductive material selected from the group consisting of organic photoconductive monomers and organic photoconductive polymers, and from 0.01 to 1.2 mole per mole of organic photoconductive monomer or per monomeric unit of the organic photoconductive polymer of indenothiophenone or a derivative thereof of the formulas:





wherein R_1, R_2, R_3, R_4, R_5 and R_6 are hydrogen or nitro groups.

4,066,455
SELENIUM CONTAINING MULTI-ACTIVE PHOTOCONDUCTIVE ELEMENT

William Mey, and David S. Bailey, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 5, 1975, Ser. No. 628,879
Int. Cl.[2] G03G 5/04
U.S. Cl. 96—1.5 R 7 Claims

1. A photoconductive insulating element having at least three layers in electrical contact with one another, said layers comprising a charge transport layer coated over a photoconductive selenium-containing layer and a charge-generation layer,

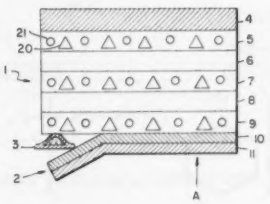
said charge-generation layer comprising a continuous electrically insulating polymer phase and dispersed in said continuous phase a discontinuous phase comprising a finely-divided, particulate co-crystalline complex of (i) at least one polymer having an alkylidene diarylene group in a recurring unit and (ii) at least one pyryliumtype dye salt, said co-crystalline complex, upon exposure to activating radiation for said complex, capable of generating and injecting charge carriers into said charge-transport layer, and

said charge-transport layer being an organic composition free from said co-crystalline complex and said pyryliumtype dye salt, and comprising as a charge-transport material a p-type organic photoconductive material capable of accepting and transporting injected charge carriers from said charge-generation layer.

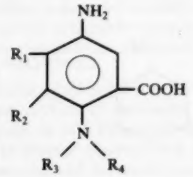
4,066,456
INCORPORATED CARBOXY SUBSTITUTED P-PHENYLENEDIAMINE COLOR DEVELOPER

Burton H. Waxman, Endwell; Michael C. Mourning, and Theodore Panasik, both of Vestal, all of N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Dec. 10, 1974, Ser. No. 531,399
Int. Cl.[2] G03C 5/54, 7/00, 1/40, 5/30
U.S. Cl. 96—29 D 19 Claims



1. A photographic element, comprising a supported, light-sensitive silver halide emulsion having incorporated therein, or in a layer adjacent thereto, the compound of the general formula:



where

R_1 is hydrogen, halogen, an aliphatic group or an aromatic group;

R_2 is hydrogen; and

R_3 and R_4 are independently hydrogen, an aliphatic group or an aromatic group; or

R_2 and R_3 together represent the necessary ring members to form a heterocyclic ring with the nitrogen atom to which R_3 is attached being the sole heteroatom or there being a second heteroatom selected from nitrogen, oxygen and sulfur; or

R_3 and R_4 together represent the necessary ring members to form a heterocyclic ring with the nitrogen atom to which they are attached being the sole heteroatom or there being a second heteroatom selected from nitogren, oxygen and sulfur; provided that at least one of R_1, R_2, R_3 and R_4 by itself, or the net effect of R_1, R_2, R_3 and R_4 is of such molecular size and essentially non-diffusible during development in an alkaline processing composition as a developer, wherein said developer is dissolved or dispersed in a high boiling, photographically inert oil.

9. A multi-color diffusion transfer photographic element, comprising

a. a photographic support;

b. a plurality of silver halide emulsion layers on said support, each emulsion layer being sensitized to light of a different color;

c. a dispersion in a high boiling photographically inert oil of a compound of claim 1 as a color developer, said oil dispersion being incorporated into said emulsion layers or layers adjacent thereto;

d. a lipophilic coupler in said oil dispersion, said coupler being non-diffusible through the photographic element at pH below the development pH but diffusible at the development pH, said coupler being reactive to form a coupled product upon coupling with the oxidation product of said color developer that is non-diffusible at the development pH, and said coupler being a colored coupler of a hue complementary to the color to which its associated silver halide emulsion layer is sensitive or being a color former reactive to form a dye having said complementary color upon coupling with oxidized color developer; and

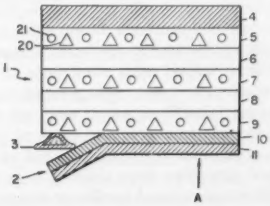
e. an image receiving means for immobilizing dye images transferred to or formed in said means.

14. A process of producing a photographic image in the photographic element of claim 9, which comprises developing the photographic element of claim 9, after image-wise exposure thereof to actinic radiation, in an alkaline medium containing a black and white photographic developer exhibiting an activating effect with the developer incorporated into the photographic element and allowing coupler that has not reacted with said incorporated developer to diffuse to the image receiving means.

4,066,457
COLOR DEVELOPER FOR DIFFUSION TRANSFER

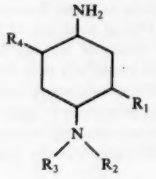
Theodore Panasik, Vestal; Felix Viro, Apalachin; Burton H. Waxman, Endwell, and Robert T. Shannahan, Endicott, all of N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Dec. 10, 1974, Ser. No. 531,400
Int. Cl.[2] G03C 7/00, 5/54, 5/30, 1/40
U.S. Cl. 96—29 D 19 Claims



1. A process of producing a photographic image in a diffusion transfer photographic element, said photographic element comprising at least one supported light sensitive silver halide emulsion layer and a dispersion of a lipophilic color former in

a high boiling photographically inert oil incorporated into, or in a layer adjacent, each said silver halide emulsion layer, which comprises developing said photographic element, after image-wise exposure to actinic radiation, in an alkaline medium of a pH below 12.5 in the presence of a color developer capable of developing silver halide and having the general formula:



where

R_1 is COOM or SO_3M,

M is H or a cation,

R_2 and R_3 are H, lower alkyl or lower alkanoyl, unsubstituted or substituted by COOM or SO_3M, with at least one of R_2 and R_3 being other than H, or R_2 and R_3 taken together represent the atoms necessary to form a saturated heterocyclic ring with the nitrogen atom to which they are attached, and R_4 is hydrogen, lower alkyl or lower alkoxy, said lipophilic color former being fast to diffusion at said pH and being reactive with oxidized color developer formed during development to form a coupled product that is diffusible at said pH, and allowing the coupled product to diffuse to an image receiving means for immobilizing said coupled product.

4,066,458

MASK-EXPOSURE SCHEME

Paul E. Stuckert, Katonah, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 474,627, May 30, 1974, abandoned. This application May 8, 1975, Ser. No. 575,859

Int. Cl.[2] G03C *5/04, 5/06*

U.S. Cl. 96—41 **7 Claims**

1. A method of synthesizing a composite image on a radiation responsive surface consisting passing radiation through a plurality of spaced apart individual rectilinear mask apertures for a given period of time to expose a plurality of first similarly shaped areas on said surface, passing radiation through said apertures during a second period of time and effectively displacing said apertures to expose a second plurality of similarly shaped areas contiguous to said first areas respectively, passing radiation through said apertures during a third period of time and effectively displacing said apertures to expose a plurality of third similarly shaped areas contiguous to said first and second respective areas and passing radiation through said apertures during a fourth period of time and effectively displacing said aperture to expose a plurality of fourth similarly shaped areas contiguous to said first, second and third respective areas said displacing steps defining a rectilinear closed path to define a total exposed rectilinear image and said apertures being so spaced from each other that the synthesized image of each aperture formed by the four step exposure-displacement process described above is contiguous to the adjacent synthesized image to provide a large synthesized rectilinear exposure image on the surface.

4,066,459

FREE RADICAL PHOTOSENSITIVE COMPOSITIONS WITH IMPROVED SENSITIVITY AND SHELF LIFE STABILITY

Paul L. Bachman, Cleveland Heights, and John J. Moskal, Bedford, both of Ohio, assignors to Horizons Incorporated, a division of Horizons Research Incorporated, Cleveland, Ohio

Filed Jan. 26, 1976, Ser. No. 652,159

Int. Cl.[2] G03C *5/32, 1/52, 1/76*

U.S. Cl. 96—45.2 **13 Claims**

1. In a photosensitive composition consisting essentially of:

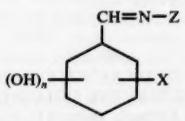
a. at least one leuco diaryl- or triaryl-methane dye forming compound;

b. at least one dye base selected from the group consisting of styryl dye bases, cyanine dye bases and merocyanine dye bases;

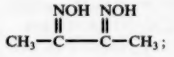
c. at least one organic halogen compound which produces free radicals when exposed to a suitable dose of electromagnetic radiation; and

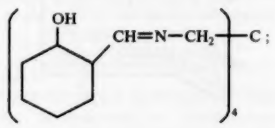
d. a film forming polymer in which constituents (a), (b) and (c) are supported;

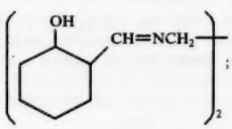
the improvement which comprises including in said composition an organic imino compound containing at least one hydroxyl group and selected from the group consisting of compounds represented by the following formulae:

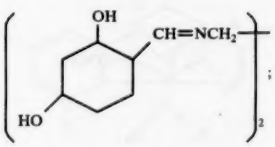


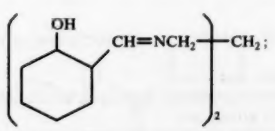
in which *n* is an integer up to 3 and the OH groups occupy at least one ortho-site; X is an alkyl, aryl or halogen group and Z is selected from the group consisting of OH and alkyl with up to 4 carbon atoms;











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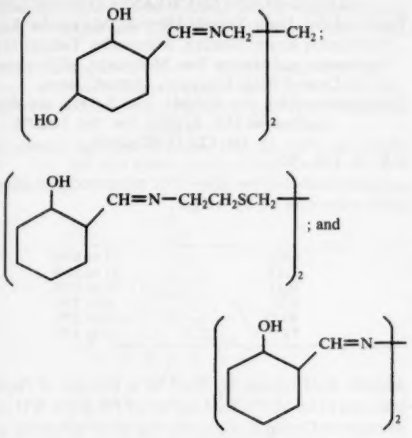


; and

4,066,460

IMAGING AND RECORDING OF INFORMATION UTILIZING TELLURIUM TETRAHALIDE

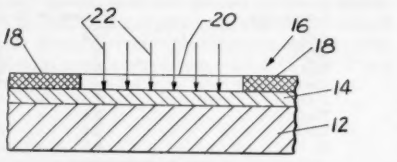
Yew C. Chang, Oakville, Canada; Stanford R. Ovshinsky, Bloomfield Hills, and Ronald W. Citkowski, Pleasant Ridge, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 400,849, Sept. 26, 1973, abandoned. This application July 17, 1975, Ser. No. 596,616

Claims priority, application United Kingdom, July 17, 1974, 31676/74

Int. Cl.[2] G03C *5/24, 1/00*

U.S. Cl. 96—48 R 30 Claims



1. A method for producing a record of retrievable information:

providing a layer which comprises an imaging material in the form of a tetrahalide of tellurium in which the halide is at least one member selected from the group consisting of chlorine and bromine, said imaging material having one detectable characteristic and which is capable of undergoing a chemical change in response to the application of energy to produce a material of different chemical character having another detectable characteristic, said imaging material being dissolved or dispersed in a polymeric matrix material,

the step of applying imaging particle or wave radiation to at least a certain portion of said layer to bring about the chemical change in said imaging material in said certain portion of said layer to produce said material of different chemical character and to record the desired information in said layer.

6. A method for producing an image comprising:

providing a layer which comprises an imaging material having the formula $TeCl_nBr_m$ where *n* is an integer from 2 to 4 and m is an integer from 0 to 2 with the proviso that the sum of n and m equals 4, said imaging material being dissolved or dispersed in a polymeric matrix material,

applying imaging particle or wave radiation to at least a certain portion of said layer to decompose said imaging material to form a latent image,

and then subjecting said latent image to heat or reducing sugars to convert said latent image into a developed image which is defined by crystals of tellurium.

26. An article for producing a record of retrievable information comprising a layer of an imaging material and a spectral sensitizer on a substrate, said imaging material comprising a tetrahalide of tellurium in which the halide is at least one member selected from the group consisting of chlorine and bromine, said imaging material having one detectable characteristic and which is capable of undergoing a chemical change in response to the application of particle or wave radiation to produce a material of different chemical character having another detectable characteristic, said imaging material and spectral sensitizer being dissolved or dispersed in a polymeric matrix material.

4,066,461

COLOR PHOTOGRAPHIC PROCESS

Isao Shimamura; Shoji Ishiguro, and Junkichi Ogawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

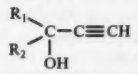
Filed Oct. 27, 1976, Ser. No. 735,936

Claims priority, application Japan, Oct. 27, 1975, 50-129100

Int. Cl.[2] G03C *5/30*

U.S. Cl. 96—66.3 5 Claims

1. A color photographic process which comprises processing imagewise exposed silver halide color photographic materials by a p-phenylene-diamine color developer containing a 2-alkyne-1-ol represented by the general formula



wherein R_1 and R_2, which may be the same or different, each represents a hydrogen atom, an alkyl group, a hydroxyalkyl group, an aminoalkyl group, a carboxyalkyl group, or a formylalkyl group.

4,066,462

ANTI-CORROSIVE ORGANIC PIGMENT

Shojiro Horiguchi, Tokyo; Michiei Nakamura, Soka, and Yoshifumi Sugito, Koshigaya, all of Japan, assignors to Dainichiseika Color & Chemicals Mfg. Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1976, Ser. No. 717,401

Claims priority, application Japan, Sept. 1, 1975, 75-104954

Int. Cl.[2] C09D *5/08*

U.S. Cl. 106—14 15 Claims

1. An anti-corrosive organic pigment prepared by a process, comprising:

mixing 1 part by wt of a lignin compound with from 0.5 to 5 parts by wt. of at least one nitrogen containing compound selected from the group consisting of urea, biuret, guanidine, biguanide, dicyandiamide, melamine, ammeline ammelide, melame, ammonium carbamate, cyanates, isocyanates, methylenediurea, ammonia, ammonium carbonate, and ammonium formate;

condensing said compounds by heating the mixture to the molten state, and

preparing said pigment by pulverizing, grinding or dispersing said condensed product.

4,066,463
SILICATE-CONTAINING FLAME-RESISTANT ADHESIVE COMPOSITION

Jacques Antoine Leon Francois Chollet, 16, Avenue Victor Hugo, 92 170 Vanves, France

Filed Sept. 16, 1975, Ser. No. 613,857
Claims priority, application France, Oct. 9, 1974, 74.33915
Int. Cl.[2] C09D *5/18*
U.S. Cl. 106—15 FP 7 Claims

1. Silicate-containing flame-resistant composition, comprising (1) an inorganic component comprising, with respect to the weight of the total composition, (a) 20wt% to 50wt% of a concentrated aqueous alkali metal silicate solution having a concentration of 38° to 42° Be, (b) 7wt% to 20wt% of kaolin and (c) 2wt% to 7wt% of deflocculated asbestos fibres; (2) an organic component, present as a 30–70% aqueous solution, selected from the group consisting of carboxymethylcellulose, starch ether, dextrin and a mixture thereof, said organic component, calculated as dry weight, being present in an amount of about 0.2wt% to about 2wt%, by weight of the total composition; and (3) 30wt% to 60wt%, by weight of the total composition, of crude perlite.

4,066,464
OPTICAL GLASSES WITH IMPROVED VARYING PARTIAL DISPERSION IN THE OPTICAL POSITIONAL RANGE OF LANTHANUM CROWN GLASSES AND LANTHANUM FLINT GLASSES

Marga Faulstich, Mainz, and Walter Geffcken, Mainz-Gonsenheim, both of Germany, assignors to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Continuation of Ser. No. 402,805, Oct. 2, 1973, abandoned. This application Feb. 10, 1976, Ser. No. 656,900
Claims priority, application Germany, Oct. 2, 1972, 2248255
Int. Cl.[2] C03C *3/08, 3/04, 3/30*
U.S. Cl. 106—47 Q 12 Claims

1. Optical glasses containing barium borosilicate having a varying partial dispersion $P_{g,F} = (n_g - n_f)/(n_F - n_C)$ in the optical positional range of lanthanum crown and lanthanum flint glasses having an index of refraction of about 1.642 to 1.742 and ν_d of about 44.0 to 58.0 and wherein the amount of SiO_2 present in the glass satisfies the following condition:

$$\frac{[Si_4O]}{[Si_4O] + [B_4O]}$$

is at least 0.62 and the content of fluorine in said glass is at least 7 grams per 100 cc. of said glass consisting essentially of:

	weight percent
SiO_2	20 to 26
B_2O_3	3 to 8
BaO	20 to 38
MgO	0 to 6
CaO	0 to 18
SrO	0 to 18
La_2O_3	20 to 32
Y_2O_3	0 to 25
ThO_2	0 to 18

and up to 12 equivalent percent of one or more of the following ingredients to adjust the required n_d and ν_d values: ZnO, PbO, CdO, TiO_2, ZrO_2, Nb_2O_5, Ta_2O_5, WO_3, MO_3 and mixtures thereof.

4,066,465
ALKALI-RESISTANT GLASS COMPOSITION

Yoshio Mohri, Lono; Takashi Hiroishi, Matsusaka; Kinzi Sano, Matsusaka; Koichi Huruya, Matsusaka; Tadashi Muramoto, Matsusaka, and Masato Tao, Matsusaka, all of Japan, assignors to Central Glass Company, Limited, Japan

Continuation of Ser. No. 630,044, Nov. 7, 1975, abandoned. This application Oct. 4, 1976, Ser. No. 728,894
Int. Cl.[2] C03C *13/00*
U.S. Cl. 106—50 2 Claims

1. An alkali-resistant glass fiber composed of a glass composition consisting of, by weight,

SiO_2	53 to 63%
ZrO_2	21 to 23%
R_2O	10 to 21%
R'O	0 to 5%
Al_2O_3	0 to 5%
F_2	0 to 1%

wherein R_2O represents Na_2O or a mixture of Na_2O and at least one of up to 5% K_2O and up to 3% Li_2O; R'O represents an oxide of Group II metal selected from the group consisting of CaO, MgO, BaO and ZnO, the total amount of the SiO_2, ZrO_2 and R_2O components in said composition ranging from 92.5 weight percent to 98.5 weight percent.

4,066,466
LOW POLLUTION GLASS FIBER COMPOSITIONS

Homer E. Neely, Jr., Tarentum, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 22, 1976, Ser. No. 707,907
Int. Cl.[2] C03C *13/00, 3/08*
U.S. Cl. 106—50 6 Claims

1. A glass composition consisting essentially of:

Component	Percent by Weight		
SiO_2	53.5	–	57
Al_2O_3	13	–	15
MgO	0	–	6
CaO	16	–	25
B_2O_3	7	–	9
Na_2O	0.4	–	1
Li_2O	0.1	–	0.5
F_2	0.1	–	0.4.

4,066,467
ALUMINOUS REFRACTORY COMPOSITION CONTAINING CARBON

Harold L. Rechter, Chicago, Ill., assignor to Chicago Fire Brick Company, Chicago, Ill.

Filed Feb. 18, 1977, Ser. No. 770,116
Int. Cl.[2] C04B *35/52*
U.S. Cl. 106—56 6 Claims

1. A plastic refractory composition comprising in percent by weight on the basis of the solids:

– inch aggregate of alumina or aluminum silicate	35–60
–60 mesh tabular or calcined alumina	20–40
Bentonite	4–8
–20 mesh carbon particles	10–18
Phosphate bonding agent	3–10
–325 mesh aluminum trihydrate	0–3
–20 mesh tetrasodium pyrophosphate	0.2–1.5
–20 mesh silicon metal	0–15

and water to bring to a plastic consistency.

4,066,468

CERAMICS OF SILICON NITRIDE

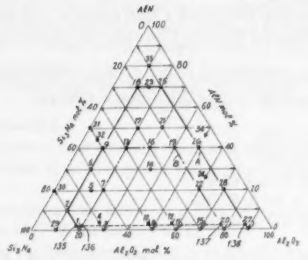
Osami Kamigaito, and Yoichi Oyama, both of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Continuation-in-part of Ser. No. 602,046, Aug. 5, 1975, abandoned, which is a division of Ser. No. 316,940, Dec. 20, 1972, Pat. No. 3,903,230. This application Apr. 8, 1977, Ser. No. 785,893

Claims priority, application Japan, Dec. 21, 1971, 46-104454

Int. Cl.[2] C04B *33/32, 35/58*

U.S. Cl. 106—73.4 9 Claims



1. A high heat resistant and high abrasion resistant ceramic comprising a silicon nitride solid solution, wherein said silicon nitride solid solution is formed by sintering a powdered mixture consisting of from 10 mol percent to 80 mol percent of silicon nitride, from 10 mol percent to 88 mol percent of alumina and from 2 mol percent to 70 mol percent of aluminum nitride at a temperature from about 1650° C to about 2000° C in a non-oxidizing atmosphere for a time between about 10 to 40 minutes.

7. A method of producing a high heat-resistant and high abrasion-resistant ceramic comprising a silicon nitride solid solution comprising the steps of forming a powdered mixture of from 10 mol percent to 80 mol percent of silicon nitride, from 10 mol percent to 88 mol percent of alumina and from 2 mol percent to 70 mol percent of aluminum nitride and sintering said mixture at a temperature from 1650° C to 2000° C in a non-oxidizing atmosphere for from 10 to 40 minutes.

4,066,469

RAPID HARDENING CEMENT

Leslie Edward Shiel, Gravesend, and Kenneth Wilson Jones, Meopham, both of England, assignors to The Associated Portland Cement Manufacturers Limited, London, England

Continuation of Ser. No. 583,796, June 4, 1975, abandoned. This application Oct. 15, 1976, Ser. No. 732,602

Int. Cl.[2] C04B *7/02, 7/35*

U.S. Cl. 106—89 9 Claims

1. A gypsum-free cement composition exhibiting ultra-rapid attainment of high early strength as compared with ordinary Portland cement containing gypsum, and with setting properties which can be regulated, which composition consists essentially of a Portland cement clinker, which does not contain gypsum, ground to exhibit a specific surface of from 3000–7000 cm^2/g, and at least one acid salt of a base in amount sufficient to impart said ultra-rapid attainment of high early strength, said acid salt of a base being selected from the group consisting of alkali metals, ammonium and organic bases with a phosphorous-free acid and being present in amount of 0.1–10% by weight of said clinker.

4,066,470

METHOD FOR THE TREATMENT OF FINELY GRAINED MATERIAL, PARTICULARLY FOR THE PRECALCINING OF CEMENT

Kunibert Brachthauser, Bensberg; Hubert Ramesohl, Bensberg-Refrath; Klaus Beisner, Hoffnungsthal, and Horst Herchenbach, Troisdorf, all of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Mar. 9, 1976, Ser. No. 665,327

Claims priority, application Germany, Mar. 10, 1975, 2510312

Int. Cl.[2] C04B *7/36*

U.S. Cl. 106—100 8 Claims

1. A method for thermally treating finely grained material, comprising the steps:

introducing the material to be calcined into a precalcining zone at an inlet;

directing the flow of gaseous combustible fuel and oxygen into a preoxidation zone at a location spaced sufficiently below the material inlet that all the material is suspended and propelled upwardly thereof by gases rising through the preoxidation zone;

partially oxidizing and thereby heating said gaseous combustible fuel in said preoxidation zone;

directing the partially oxidized, mixture of hot, oxygen-containing fuel and oxygen upwardly into the precalcining zone and admixing the fuel with said material in said zone; and

directing the precalcined material from the precalcining zone into a calcining furnace.

4,066,471

CONSTRUCTIONAL CEMENT

Edward Burke, Rochester, England, assignor to The Associated Portland Cement Manufacturers Limited, London, England

Filed Nov. 17, 1975, Ser. No. 632,796

Claims priority, application United Kingdom, Nov. 26, 1974, 51142/74; June 24, 1974, 26715/75

Int. Cl.[2] C04B *7/32*

U.S. Cl. 106—104 9 Claims

1. A method of making a constructional cement which comprises (a) artificially preparing a particulate chemical combination of oxides selected from the group consisting of anorthite with excess silica in solid solution in the anorthite wherein the excess silica is present in amount of at least 5% by weight, and anorthite with albite in solid solution in the anorthite wherein the albite is present in amount not greater than 30% by weight, by sintering an intimate mixture of minerals which severally contribute the constitutent oxides of the combination or of compounds which form said oxides under sintering conditions, in stoichiometric proportions to form said combination, whereby said oxides combine, and grinding the sintered product; and (b) reacting said ground product with an amount sufficient to bring about hardening thereof, of an aqueous solution containing 35 to 60% by weight of orthophosphoric acid.

4,066,472

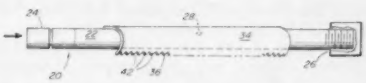
SCRAPER NOZZLE FOR WAREWASHING MACHINE

Kenneth E. Perry, Wellesley, Mass., assignor to Adamation, Inc., Newton, Mass.

Filed Nov. 22, 1976, Ser. No. 743,933

Int. Cl.[2] B05B *1/26;* B08B *3/02*

U.S. Cl. 134—34 14 Claims



1. A scraper nozzle for use in a warewasher to remove foreign matter from a surface, which comprises:

a. a water conduit having at least one aperture for the discharge of water therefrom;
b. a baffle plate in fluid flow communication with the conduit, the plate including a discharge edge spaced apart from the conduit, said discharge edge including a plurality of protuberances thereon, the protuberances being spaced and formed to provide a substantially sheet-like discharge of water therefrom;
the baffle plate diminishing in cross-sectional area from a downstream end to an upstream end to control the flow of water across at least one surface of the baffle plate and to provide a uniform flow rate at the discharge edge, the upstream end of the baffle plate being directly opposed to the aperture for the water discharged from conduit whereby because of the dimensioning of the baffle plate a back pressure is created which results in redistribution of the water to the downstream end and the uniform discharge of water across the discharge edge.

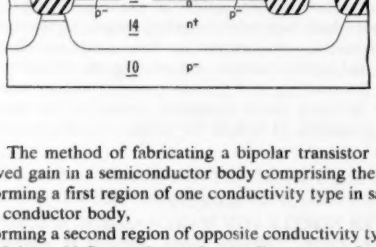
6. A method for the removal of foreign matter from surfaces, such as wares, with a scraper nozzle, the nozzle comprising a baffle plate having a planar surface and an arcuate surface, the arcuate surface terminating in a discharge edge, the baffle diminishing in cross-sectional area from a downstream end to an upstream end, which method includes:
a. discharging a stream of water onto the upstream end creating a back pressure and redistribution of the water toward the downstream end;
b. flowing the water across the entire arcuate surface;
c. discharging the water from the discharge edge in a plurality of streams of water of substantially uniform volume and velocity, the streams subsequently merging to form a uniform sheet of high velocity water; and
d. contacting the surfaces to be cleaned.

4,066,473

METHOD OF FABRICATING HIGH-GAIN TRANSISTORS

David O'Brien, Mountain View, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed July 15, 1976, Ser. No. 705,382
Int. Cl.² H01L *21/26*
U.S. Cl. 148—1.5 **12 Claims**



1. The method of fabricating a bipolar transistor with improved gain in a semiconductor body comprising the steps of:
forming a first region of one conductivity type in said semiconductor body,
forming a second region of opposite conductivity type overlying said first region and extending to a surface of said semiconductor body;
removing part of said second region; and
diffusing a dopant of said one conductivity type into said second region where said part has been removed, thereby converting the net conductivity of a portion of said second region to said one conductivity type,
said first region of one conductivity type comprising the transistor collector, said second region of opposite conductivity type comprising the transistor base, and said portion of said second region having a net conductivity of said one conductivity type comprising the transistor emitter.

4,066,474

METHOD OF MAKING HIGH STRENGTH COLD REDUCED STEEL BY CONTINUOUS ANNEALING PROCESS

Kuniki Uchida; Kenzi Araki, both of Yokohama; Shiro Fukunaka, Fukuyama, and Takao Kurihara, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 545,027, June 30, 1976, abandoned. This application June 30, 1976, Ser. No. 701,183
Claims priority, application Japan, Jan. 31, 1974, 49-12187
Int. Cl.² B22D *25/00*; C21D *1/00*
U.S. Cl. 148—2 **4 Claims**

1. In a method of making a high strength cold reduced steel with a continuous annealing process, the improvement which comprises:
maintaining the chemical composition of the steel in the steel making stage within the following ranges:

C: 0.04 to 0.10%,
P: 0.04 to 0.20%,
S: not more than 0.02%,
Mn: [S]% × 10 to 0.70%,
balance: Fe and impurities;

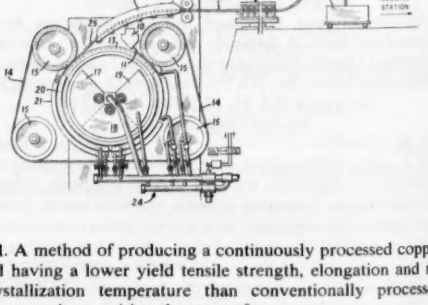
hot rolling and cold reducing the steel, and subjecting the resulting cold reduced steel to a continuous annealing process comprising the following heat cycle:
i. heating the resulting cold reduced steel to and maintaining the heated steel at a temperature of from Ac_1 to 900° C. for from 10 to 120 seconds,
ii. quenching the steel of (i) which is at a temperature of from Ac_1 to 900° C. with a jet stream of water,
iii. tempering the quenched steel at a temperature of from 200° C. to 500° C. for from 10 to 180 seconds, and
iv. cooling and coiling the tempered steel,
the steel so obtained having a Lankford value of at least 1.1, tensile strength of from 40 to 80 kg/mm², elongation of more than 20% and spot weldability of more than 900 kg/spot.

4,066,475

METHOD OF PRODUCING A CONTINUOUSLY PROCESSED COPPER ROD

E. Henry Chia, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Continuation-in-part of Ser. No. 509,372, Sept. 26, 1974, abandoned. This application June 16, 1976, Ser. No. 696,801
Int. Cl.² B22D *11/12*
U.S. Cl. 148—3 **10 Claims**



1. A method of producing a continuously processed copper rod having a lower yield tensile strength, elongation and recrystallization temperature than conventionally processed copper rod comprising the steps of:
a. continuously casting molten copper containing normal impurities into a cast bar at a rate at which said impurities are trapped in solid solution;
b. substantially immediately hot-rolling the cast bar in the

as-cast condition into continuous rod at a rate at which said impurities are retained in solid solution;

c. hot-coiling the continuous rod prior to any substantial cooling thereof from the hot-rolling temperature; and

d. gradually cooling the coiled rod to room temperature to permit precipitation of substantially all of said impurities thereby lowering the recrystallization temperature of the rod.

4,066,476

DUPLEX PROCESS FOR IMPROVING THE HOT WORKABILITY OF ALUMINUM-MAGNESIUM ALLOYS

Damian V. Gullotti, Cheshire, Conn.; William S. Fayard, Biloxi, and Wiley W. Wedgeworth, Gulfport, both of Miss., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Aug. 11, 1976, Ser. No. 713,523
Int. Cl.[2] C22F *1/04*
U.S. Cl. 148—11.5 A **11 Claims**

1. A method of heat treating aluminum alloys of the aluminum-magnesium type to improve hot workability which comprises:

a. homogenizing said alloys at a first temperature of from 950° to 1050° F for from 2 to 12 hours;

b. cooling the homogenized alloys to a second temperature at a rate of less than 100° F per hour;

c. further homogenizing said alloys at said second temperature where said second temperature is from 750° to 900° F for from 2 to 12 hours; and

d. finally cooling said alloys to room temperature.

4,066,477

METHOD OF MAINTAINING TEMPERATURE OF SALT BATH DURING QUENCHING OF STEEL WIRE

Hermann-Josef Bockenhoff, Blecher; Walter Schaeffer, Cologne, and Berthold Kranz, Duren, all of Germany, assignors to Arbed F & G Drahtwerke Cologne GmbH, Cologne, Germany

Filed July 24, 1975, Ser. No. 598,666
Claims priority, application Germany, July 25, 1974, 2435832
Int. Cl.[2] C21C *7/06*; G05D *23/13*
U.S. Cl. 148—15 **5 Claims**

1. A method for the continuous microstructure-developing treatment of steel wire in molten salt baths, comprising rapidly cooling hot steel wire by continuously introducing said hot steel into a relatively cool molten salt bath having a working temperature which is within a range of 450°–600° C; and maintaining the temperature of said relatively cool salt bath within the range of 450°–600° C despite the quantities of heat which are brought into said molten salt bath during the step of introducing and which would substantially increase the working temperature to a temperature beyond the range of 450°–600° C., said step of maintaining comprising mixing liquid water with a gas selected from the group consisting of air and nitrogen, and subsequently injecting the mixture of water and gas into said molten salt bath.

4,066,478

BASIC AGGLOMERATED FLUX WITH A HIGH CAO CONTENT FOR THE WELDING OF ORDINARY OR LOW ALLOY STEELS

Robert Jean De Haeck, St. Pieters-Kapelle, Belgium, assignor to La Soudure Electrique Autogene, Procedes Arcos, S.A., Brussels, Belgium

Filed Dec. 13, 1976, Ser. No. 749,837
Claims priority, application Belgium, Dec. 18, 1975, 162851
Int. Cl.[2] B23K *35/24*
U.S. Cl. 148—26 **8 Claims**

1. A prefused basic flux for submerged arc welding, under both alternating and direct current, of steels of high elastic limits, consisting essentially of, in weight %:

SiO_2	about	25	to about	35%
Al_2O_3	about	2	to about	6%
TiO_2	about	3	to about	7%
CaF_2	about	5	to about	11.25%
CaO	about	44	to about	52%
MgO	about	1	to about	10%
MnO	about	0.5	to about	5%
Na_2O	about	4.5	to about	8%
K_2O	about	0.5	to about	1.5%
FeO		0	to about	2%

wherein the weight ratio of CaO to CaF_2 is equal to or greater than about 4.

4,066,479

PROCESS FOR PRODUCING NON-DIRECTIONAL ELECTRIC STEEL SHEETS FREE FROM RIDGING

Yoshiaki Shimoyama, and Kunisuke Miyoshi, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed July 6, 1973, Ser. No. 377,012
Claims priority, application Japan, July 8, 1972, 47-67887
Int. Cl.[2] H01F *1/04*
U.S. Cl. 148—111 **3 Claims**

1. In a process for producing non-directional electric steel sheets free from ridging comprising preparing slabs by continuous casting from molten steel containing not more than 0.04% C, 1.5 to 4.0% Si the balance being Fe and unavoidable impurities, hot rolling, cold rolling and annealing the slabs, the improvement which comprises subjecting the slabs to breaking-down with a reduction rate between 10 and 70% in the sheet thickness direction at a temperature between 1000° – 1300° C prior to the hot rolling.

4,066,480

PROCESS FOR IMPROVING THE HOT WORKABILITY OF ALUMINUM-MAGNESIUM ALLOYS

Damian V. Gullotti, Cheshire, Conn.; William S. Fayard, Biloxi, and Wiley W. Wedgeworth, Gulfport, both of Miss., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Aug. 11, 1976, Ser. No. 713,524
Int. Cl.[2] C22F *1/04*
U.S. Cl. 148—11.5 A **10 Claims**

1. A method of heat treating aluminum alloys of the aluminum-magnesium type to improve hot workability which consists essentially of:

a. homogenizing said alloys at a temperature of from 950° to 1050° F for from 2 to 12 hours; and

b. cooling said alloys to at least 800° F at a rate of less than 100° F per hour.

4,066,481

METALORGANIC CHEMICAL VAPOR DEPOSITION OF IVA-VIA COMPOUNDS AND COMPOSITE

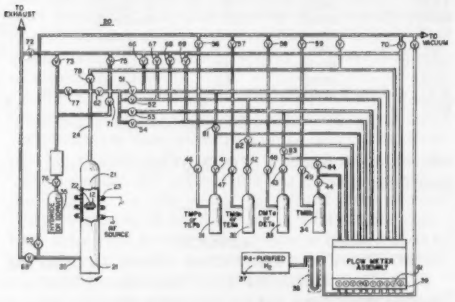
Harold M. Manasevit, Anaheim, and William I. Simpson, Orange, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 523,599, Nov. 11, 1974, abandoned. This application Jan. 7, 1976, Ser. No. 647,222
Int. Cl.[2] H01L *21/205, 21/84*
U.S. Cl. 148—174 **15 Claims**

1. A method for forming a layer of Group IVA–VIA material on an amorphous substrate of glass or fused quartz or a monocrystalline or a polycrystalline substrate selected from the group consisting of Group IA - Group VIA compounds, Group II - Group VI compounds Group IIA- Fluorides, Group IIIA - Group VA compounds and Group IV - Group VI compounds, α- Al_2O_3 and $MgAl_2O_4$, comprising the steps of:

establising a heated deposition zone at a temperature within

the range 400°–700° C and encompassing a deposition surface of said substrate;



forming a gaseous mixture of metalorganic IVA-containing and VIA-containing components; and

pyrolyzing said mixture within said heated deposition zone.

4,066,482

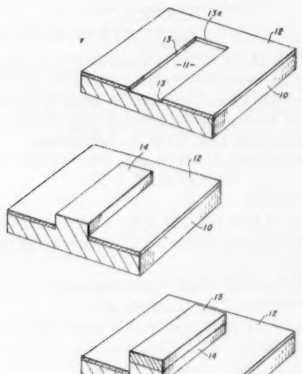
SELECTIVE EPITAXIAL GROWTH TECHNIQUE FOR FABRICATING WAVEGUIDES FOR INTEGRATED OPTICS

Don W. Shaw, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 458,628, April 8, 1974, Pat. No. 3,984,173. This application Apr. 2, 1976, Ser. No. 673,025

Int. Cl.[2] H01L *21/20, 29/06*

U.S. Cl. 148—175 **3 Claims**



1. A method of making an optical waveguide of semiconductor material comprising the steps of:

forming a first mask on a surface of a monocrystalline semiconductor substrate of one conductivity type, wherein said surface is parallel to a relatively fast growing crystallographic plane of semiconductor material to be epitaxially deposited on said monocrystalline semiconductor substrate,

patterning said first mask to remove a portion thereof providing an opening through the mask exposing an elongated area of said surface, wherein the opposite side walls of the opening formed in the first mask by the removal of the masked portion and bounding the exposed surface area of said substrate are arranged parallel to relatively slow growing crystallographic planes of semiconductor material to be epitaxially deposited on said semiconductor substrate as compared to relatively fast growing crystallographic planes of said semiconductor substrate,

epitaxially depositing a first semiconductor material of said one conductivity type on the exposed surface area of said semiconductor substrate in said relatively fast growing crystallographic plane to provide a first continuous raised elongated epitaxially semiconductor layer having smooth planar faceted growth side surfaces confined by the opposite sidewalls of the opening in the mask which are in relatively slow growing crystallographic planes and a smooth planar faceted growth top surface which is in a relatively fast growing crystallographic plane, said first semiconductive material having a free carrier concentration, resistivity, and refractive index substantially the same as said semiconductor substrate,

forming a second mask on said substrate surface in the same position as said first mask and to a thickness wherein said second mask covers the top surface of said first epitaxial semiconductor layer,

patterning said second mask to remove a portion thereof providing an opening through the mask exposing the top surface of said first continuous epitaxial semiconductor layer, wherein the opposite sidewalls of the opening formed in said second mask and bounding the exposed top surface of said first continuous epitaxial semiconductor layer are arranged parallel to said relatively slow growing crystallographic planes of semiconductor material to be epitaxially deposited on the top surface of said first continuous epitaxial semiconductor layer, and

epitaxially depositing a second semiconductor material of said one conductivity type on the exposed top surface of said first continuous epitaxial semiconductor layer in a said relatively fast growing crystallographic plane to provide a second continuous elongated epitaxial semiconductor layer which has each of its surface including top, bottom, and side surfaces formed as a smooth planar faceted growth surface, said second semiconductor material having a relatively low free carrier concentration and correspondingly high resistivity as compared to a relatively high free carrier concentration and correspondingly low resitivity of said first semiconductor material.

4,066,483

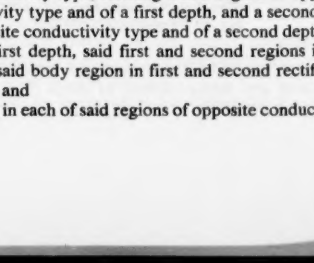
GATE-CONTROLLED BIDIRECTIONAL SWITCHING DEVICE

Frederick A. D'Altroy; Daniel J. Harrington, and Gerald W. Miller, all of Center Valley, Pa., assignors to Western Electric Company, Inc., New York, N.Y.

Filed July 7, 1976, Ser. No. 703,162

Int. Cl.[2] H01L *21/225*

U.S. Cl. 148—187 **5 Claims**



1. A method of making a bidirectional semiconductor switching device comprising:

adjacent a body region of semiconductor material of one conductivity type, forming a first region of opposite conductivity type and of a first depth, and a second region of opposite conductivity type and of a second depth less than said first depth, said first and second regions interfacing with said body region in first and second rectifying junctions; and

forming in each of said regions of opposite conductivity type

a third region of the one conductivity type, each of said third regions interfacing with their respective regions of opposite conductivity type in third rectifying junctions, said third junction adjacent said first region being separated from said first junction by a distance greater than that which separates said third junction adjacent said second region from said second junction, to form between said body region and said third region in said second region a zone having a greater resistance to a current flow parallel to said junctions interfacing said second region with its adjacent regions than the resistance to a corresponding current flow in a corresponding zone in said first region parallel to its adjacent junctions.

4,066,484

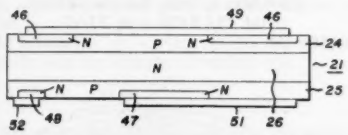
METHOD OF MANUFACTURE OF A GOLD DIFFUSED THYRISTOR

Joseph Moyson, Union Springs, N.Y., assignor to General Electric Company, Auburn, N.Y.

Division of Ser. No. 517,523, Oct. 24, 1974, abandoned. This application Sept. 24, 1975, Ser. No. 616,404

Int. Cl.² H01L *21/22*

U.S. Cl. 148—187 **8 Claims**



1. In a method of making a thyristor utilizing a diffusion mask in the formation, at a first temperature, of a cathode emitter characterized by an impurity type selected from the group consisting of arsenic and antimony, the improvement consisting of the step of diffusing, at a second temperature lower than the said first temperature, essentially only into said cathode emitter and the area therearound, using said diffusion mask, an auxiliary dopant to reduce the carrier lifetime in said cathode emitter while maintaining the carrier lifetime in the remainder of said device.

4,066,485

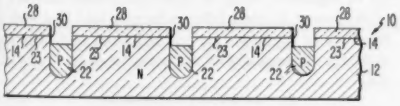
METHOD OF FABRICATING A SEMICONDUCTOR DEVICE

Wojciech Rosnowski, Summit, and Richard Denning, Springfield, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 21, 1977, Ser. No. 761,426

Int. Cl.² H01L *21/225*

U.S. Cl. 148—188 **6 Claims**



1. A method of fabricating a semiconductor device comprising the steps of:

heating, in an ambient containing oxygen, a body of silicon having a layer of aluminum on a portion of a surface thereof to a temperature whereat said aluminum diffuses into said body and maintaining said body at said temperature for a preselected period of time, whereby said aluminum diffuses into said body and simultaneously forms an aluminum/silicon alloy on said portion of said surface, said aluminum/silicon alloy having a cap of aluminum oxide thereover, the remainder of said surface having a layer of silicon dioxide simultaneously formed thereon; and

treating said body with an etchant which attacks said cap, said alloy and said body at a comparatively faster rate than it attacks said layer of silicon dioxide, said treating step being carried out until recesses are formed in said body beneath said alloy, whereby a photomask can be visually aligned with said recesses.

4,066,486

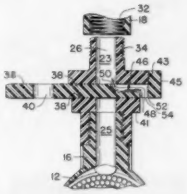
CABLE PRESSURE BLOCK FORMING KIT AND VALVE APPARATUS

Gene S. T. Tan, Westlake Village, Calif., assignor to Hexcel Corporation, Dublin, Calif.

Filed June 7, 1976, Ser. No. 693,618

Int. Cl.² H01B *17/38;* H02G *15/00*

U.S. Cl. 156—48 **21 Claims**



1. In apparatus for forming pressure blocks in a cable defined by a cable core in an interior space of a core-surrounding outer sheath, the apparatus having a pressure tap fitting defined by a base sheet for placement over an opening in the cable sheath and an injection port projecting from the sheet, injection means including a pressure applying member for flowing a fluid material under pressure through the port into the interior space to thereby form a pressure tight block in the cable, and valve means between the injection means and the injection port, the improvement to the valve means comprising: a housing including a passage therethrough for connection to the injection means and the port, and a closure member movably mountable in three positions to the housing and dividing the passage into an upstream portion communicating with the injection means and a downstream portion communicating with the port, the closure member including first, second and third sections respectively corresponding to the three positions, the first section of the closure member including means establishing a free fluid communication path between the passage portions, the second section including pressure tight means sealing the passage portions from each other, and the third section including means communicating the upstream portion with the exterior of the housing and means sealing the downstream portion from the upstream portion and the housing exterior; whereby fluid material under pressure can be retained in the interior space of the cable core while the upstream portion of the passage is vented to the exterior to facilitate the removal of the pressure applying member and the refilling of the injection means with fluid material without uncoupling the injection means and the injection port for the subsequent injection of additional fluid material under pressure into the interior space.

21. A method for forming a pressure block in an interior space of a cable having an outer cable sheath comprising the steps of mounting a pressure tap fitting to the cable, the fitting having a port communicating the cable interior with the exterior; providing a fluid material-injecting cartridge including a cartridge housing, a pressure-applying plunger disposed interiorly of the housing and a nozzle for the discharge of pressurized material from the housing interior; placing a curable fluid material into the housing interior; laterally displacing a barrier having a first interior passage and a second passage so as to

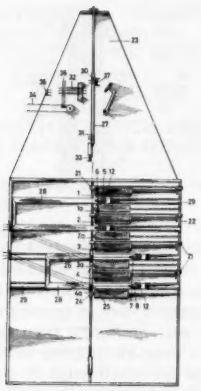
align said first interior passage with both said port and nozzle; thereafter advancing the plunger to thereby inject the material in the cartridge through the first passage into the cable interior; thereafter laterally displacing the barrier to seal the cable interior from the housing interior and to form vacuum-breaking fluid communication between the nozzle and the housing exterior through the second passage such that fluid pressure across the plunger remains substantially equalized; and withdrawing the plunger from the housing.

4,066,487

METHOD AND DEVICE FOR MAKING A NON-WOVEN PILE WEB

Cornelis W. Beelien, 1e Const. Huygensstraat 59, Amsterdam, Netherlands

Filed May 10, 1976, Ser. No. 685,131
Int. Cl.[2] D04H *11/00*
U.S. Cl. 156—72 **18 Claims**



1. Method for making a nonwoven pile web from differently coloured pile yarns lying side by side and being arranged so as to form a colour-figuration and being adhered perpendicularly in a sub-layer, characterized in that simultaneously two rows of differently coloured yarn end portions having a length equal to a multiple of the desired pile height are arranged in the sequence of the desired colour-figuration, between which in cross-direction and at a mutual spacing of two times the desired pile height a number of adhesive-impregnated threads extending parallel to each other and disposed in series of two are pressed and joined to said yarn end portions to form a continous, multicoloured web, cutting the yarn ends of said multicoloured web in a direction parallel to the impregnated threads before the first impregnated thread and between the threads of each pair of impregnated threads to form a number of strips, advancing said multicoloured web and repeating the above steps to form additional sections of each individual strip to provide a length equal to the desired width of the carpet web to be made and a width equal to twice the desired pile height of the web to be made and stacking and mutually connecting said strips along the adhered, impregnated threads.

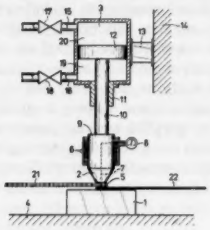
4,066,488

PROCESS FOR THE JOINING (BONDING) OF LINES (STRIPS)

Alfred von der Lehr, Eichenstrasse 21, Germany

Filed Apr. 7, 1977, Ser. No. 785,563
Claims priority, application Germany, Apr. 9, 1976, 2615460
Int. Cl.[2] B32B *31/02*
U.S. Cl. 156—83 **3 Claims**

1. Process for the joining of strips of acetalysed polyvinyl alcohol foam with each other or with textile fabrics, with the distinction that the parts of the strips to be joined together are brought in contact with each other and hot pressed, in the presence of moisture at temperatures of 100°–300° C., preferably 200°–250° C., and a pressure of 1–10 kp/cm², preferably 4–6 kp/cm².

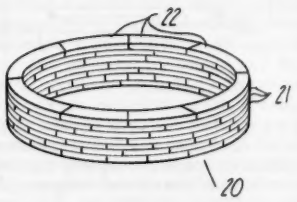


4,066,489

METHOD FOR MAKING ANNULAR ARTICLES

Joseph R. Hannum, Norristown, and Gerard R. Santos, Levittown, both of Pa., assignors to The Budd Company, Troy, Mich.

Filed May 5, 1976, Ser. No. 683,565
Int. Cl.[2] B32B *1/08, 27/42*
U.S. Cl. 156—258 **13 Claims**



1. The method of making annular articles comprising the steps of:

forming form a strip of material a first plurality of similarly shaped arcuate blank segments,

forming from said strip of material a second plurality of arcuate blank segments identical in shape to said first plurality of said arcuate blank segments and inverted with respect thereto,

assembling end to end sequentially one at a time segments from said first plurality of segments and the inverted segments from said second plurality of segments,

continuing said assembling step until a plurality of layers of said segments are formed to form said annular article,

the angles of the joining ends of said first and second plurality of segments being at different complementary angles with respect to each other whereby said first and second plurality of segments are formed from said strip material utilizing substantially all the material of said strip of material.

4,066,490

METHOD FOR PRODUCING A LAWN NURSERY STRIP

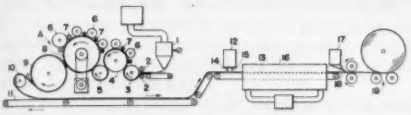
Mitsuru Yoshimi, Okazaki, Japan, assignor to Shin Nihon Ryokugaku Kabushiki Kaisha, Japan

Continuation of Ser. No. 520,985, Nov. 5, 1974, abandoned. This application June 14, 1976, Ser. No. 695,813
Int. Cl.[2] A01C *1/04*
U.S. Cl. 156—276 **1 Claim**

1. The method of making a nursery seeding strip which includes the sequential steps of,

feeding and carding regenerated cotton fibers at a constant

rate to form a strip of processed cotton material which is napped and waffled on one side,
successively spreading first liquid fertilizer and then liquid binder in the form of a spray to coat the opposite side of the strip with fertilizer and liquid binder,
thereafter drying the coated strip to produce a dried nursery cotton strip,
simultaneously leaching localized bands of synthetic liquid resins continuously onto the coated side of the nursery cotton strip to form longitudinal streaks on the nursery



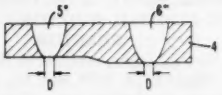
strip for increasing the tensile strength thereof in a longitudinal direction,
sowing seeds onto the opposite side of the nursery cotton strip,
vibrating the strip so that the sown seeds will settle stably into the napped surface of the strip,
successively spreading first liquid fertilizer and then liquid binder in the form of a spray over the napped, seeded surface,
and press bonding a non-woven, net-like material onto the surface to form the completed seeding strip.

4,066,491

METHOD OF SIMULTANEOUSLY ETCHING MULTIPLE TAPERED VIADUCTS IN SEMICONDUCTOR MATERIAL

Wolf-Dieter Ruh, and Gerhard Trippel, both of Sindelfingen, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 28, 1977, Ser. No. 781,616
Claims priority, application Germany, June 12, 1976, 2626420
Int. Cl.[2] B23P *15/00, 25/06*
U.S. Cl. 156—644 **8 Claims**



2. A method of fabricating a semiconductor substrate having a plurality of core-shaped viaducts therein of substantially uniform orifice dimensions at the obverse of said substrate, comprising the steps of
etching depressions by a chemical etching method to a depth short of penetrating said substrate at said obverse thereof, and
etching said depressions further by a sputter etching method until said viaducts penetrate said obverse,
whereby said uniform orifices are formed.

4,066,492

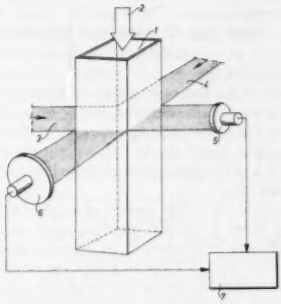
METHOD AND DEVICE FOR EXAMINING PULP FOR THE PRESENCE OF SHIVES

Jan Hill, Taby, Sweden, assignor to AB Tellusond, Stockholm, Sweden

Filed May 12, 1976, Ser. No. 685,491
Claims priority, application Sweden, May 14, 1975, 7505538
Int. Cl.[2] G01N *15/02, 21/34*
U.S. Cl. 162—49 **3 Claims**

1. A method for examining different types of pulp for shives therein, comprising the steps of flowing a suspension of the pulp through a measuring duct having transparent walls, directing at least one beam of light with a wavelength within the range from 750 to 950 nm through said measuring duct and the pulp suspension flow therein perpendicularly to the direction of the suspension flow, said light beam being comparatively thin in the direction of the suspension flow, measuring the intensity of said light beam after its passage through the measuring duct by means of a photo detector, and analyzing the output signal of said photo detector with respect to temporary reductions in its amplitude caused by the passage through said light beam of shives present in the pulp, said temporary reductions serving to indicate the presence of shives independent and insensitive to the type of pulp.

2. A device for examining different types of pulp for shives



therein, comprising a measuring duct for passing a flow of a suspension of the pulp to be examined, said measuring duct having transparent walls, at least one light source located at one side of said measuring duct wherein said light source directs a beam of light having a wavelength within the range from 750 to 950 nm through the measuring duct perpendicularly to the direction of the suspension flow therein, a photo detector disposed on the opposite side of said measuring duct for receiving said light beam after its passage through the measuring duct and for producing an output signal representative of the intensity of said light beam, and signal processing means for analysing said signal with respect to temporary reductions in its amplitude to detect the presence of shives independent and insensitive to the type of pulp.

4,066,493

TREATING CELLULOSIC MATERIALS

Keith John Pickard, Widnes, England, assignor to Laporte Industries Limited, Luton, England

Filed June 15, 1976, Ser. No. 696,183
Claims priority, application United Kingdom, June 20, 1975, 26292/75
Int. Cl.[2] D21D *3/00*
U.S. Cl. 162—158 **8 Claims**

1. In a composition for treating cellulosic materials comprising a dispersion of a cyclic imide substituted by an aliphatic hydrophobic group containing at least 12 carbon atoms and N-substituted by an acyl group as a reactive sizing or waterproofing agent the improvement comprising incorporating in said dispersion at least 10 to 125% by weight based on the cyclic imide of an aliphatic acid having an hydrophobic moiety comprising a straight chain having an effective length of at least 6 carbon atoms or a precursor of said aliphatic acid which generates said aliphatic acid in use.

7. In a method of treating cellulosic materials comprising the step of contacting the cellulosic material with a dispersion of a cyclic imide substituted by an aliphatic hydrophobic group containing at least 12 carbon atoms and N- substituted by an acyl group, at a temperature sufficiently high for reaction to occur between the cyclic imide and the cellulosic material the

improvement comprising the use of dispersion having incorporated therein at least 10 to 125% by weight based on the cyclic imide of an aliphatic acid having an hydrophobic moiety comprising a straight chain having an effective length of at least 6 carbon atoms or a precursor of said aliphatic acid which generates said aliphatic acid in use.

8. A method according to claim 7 wherein the cellulosic material is a bleached sulphate paper pulp.

4,066,494

NITROGENOUS CONDENSATION PRODUCTS USED AS RETENTION AIDS IN PAPERMAKING

Emil Scharf; Rolf Fikentscher, both of Ludwigshafen; Werner Auhorn, Frankenthal, and Werner Streit, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Rhineland-Pfalz, Germany

Filed July 10, 1975, Ser. No. 594,648
Int. Cl.[2] D21H *3/48*
U.S. Cl. 162—164 EP **3 Claims**

1. A process for the production of paper which comprises adding as drainage and retention aids to an aqueous suspension of cellulosic fibers for making paper sheet, from about 0.01 to 0.3% by weight, based on the dry weight of cellulosic fiber in the pulp, of a water-soluble crosslinked reaction product obtained by reacting

a. one equivalent of NH groups of a polyalkylene polyamine having from 15 to 500 alkyleneimine units wherein said polyalkylene polyamine is an imine homopolymer with

b. from 0.001 to 0.08 mole of a product obtained by reacting a polyalkylene oxide having from 8 to 100 alkylene oxide units with epichlorohydrin such that from 1.0 to 1.5 moles of epichlorohydrin are present per equivalent of the hydroxyl groups in the polyalkylene oxide,

at a temperature of from 20° to 100° C in aqueous solution having a solids content of from 5 to 50% by weight, the reaction being carried to a point at which the viscosity of an aqueous solution containing 20% by weight of the auxiliary is from 300 to 1,500 centipoises (20° C).

4,066,495

METHOD OF MAKING PAPER CONTAINING CATIONIC STARCH AND AN ANIONIC RETENTION AID

John E. Voigt, St. Louis County, and Herbert Pender, Jr., Ferguson, both of Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed June 26, 1974, Ser. No. 483,315
Int. Cl.[2] C08L *3/02;* D21D *3/00, 3/58;* D21H *3/00*
U.S. Cl. 162—168 NA **2 Claims**

1. A method of papermaking comprising the steps of adding from about 0.015% to about 4% by weight based on the weight of dry pulp of a cationic starch having a degree of substitution of about 0.0034 to about 0.07 and consisting essentially of the reaction product of starch and an amine alkene halide salt and from about 5 ppm to about 250 ppm based on dry pulp of an anionic polyacrylamide polymer to the pulp in a papermaking process prior to depositing the pulp on a screen, said polymer having an average molecular weight of about 4×10^6 to about 6×10^6.

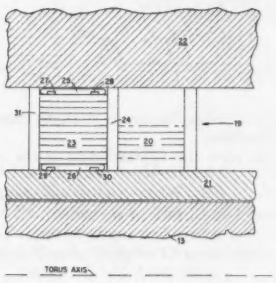
4,066,496

CRYOGENIC EXPANSION JOINT FOR LARGE SUPERCONDUCTING MAGNET STRUCTURES

Robert L. Brown, Kingston, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Continuation-in-part of Ser. No. 504,932, Sept. 11, 1974, abandoned. This application June 24, 1976, Ser. No. 699,394
Int. Cl.[2] G21B *1/00;* H01J *7/24*
U.S. Cl. 176—3 **2 Claims**

1. In a device for producing a very hot plasma and consequent production of neutrons and x-rays, including a central magnetic core, a plurality of magnetic return legs for said core, a torus liner encompassing said core, a toroidal shield encompassing said torus liner, a plurality of spaced-apart, toroidal superconducting field coils encompassing said shield, each of said coils being wound on a respective coil bobbin, a respective massive outer ring encompassing each of said coils, and a pair of bucking rings mounted between the upper and lower portions of said coil outer rings and said magnetic core, the improvement comprising a first respective peripheral expansion joint mounted between each of said coils and each of said coils bobbins, and a second respective peripheral expansion joint mounted between each of said coils and each of said outer



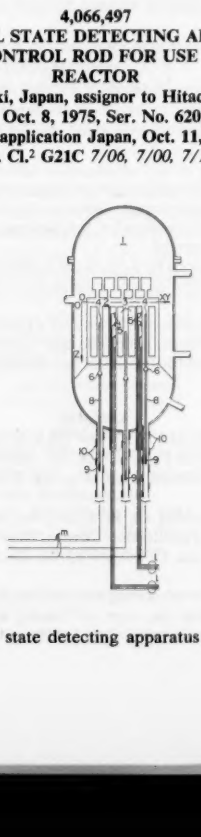
rings, each of said expansion joints comprising a flattened tube containing a refrigerant adapted to be circulated under high pressure therethrough, and each of said flattened tubes containing a pair of spacers mounted therewithin for preventing irremeable flattening thereof, whereby during cooldown of said coils and subsequent operation of said device to produce said hot plasma within said liner, said expansion joints functioning to accommodate differential thermal contraction and expansion between said coils and outer ring and between said coils and coil bobbins while at the same time aiding in said cooldown.

4,066,497

ABNORMAL STATE DETECTING APPARATUS UTILIZING CONTROL ROD FOR USE IN NUCLEAR REACTOR

Takao Sato, Ibaraki, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 8, 1975, Ser. No. 620,787
Claims priority, application Japan, Oct. 11, 1974, 49-116093
Int. Cl.[2] G21C *7/06, 7/00, 7/18*
U.S. Cl. 176—22 **21 Claims**



1. An abnormal state detecting apparatus utilizing control

rods for a nuclear reactor having a nuclear reactor core incorporated therein with a plurality of the control rods and a control rod driving device for moving selected control rods in an indicated direction for receiving a signal for selecting control rods to be operated and another signal for indicating a direction in which the control rod is moved, comprising;

a magnet provided on a member movable together with the control rod;

reed switches stationary provided on fixed positions arranged in an equally spaced manner in the direction of movement of the control rod for producing an output when said magnet approaches to said reed switches;

a first memory for memorizing outputs of position detectors associated with the control rod to be operated when supplied with the selection signal and the moving direction signal for the control rod;

a timer producing an output at the termination of a waiting time interval corresponding to the moving direction signal;

estimating means for estimating an output of the position detector at the termination of said waiting time interval by receiving an output of the first memory and the moving direction signal;

a second memory for memorizing an output of the position detector when the timer produces the output; and

abnormal detecting means for determining an abnormal state when the output of the second memory does not coincide with the output of the estimating means.

4,066,498

SHUT-OFF AND SAFETY DEVICE FOR A LIVE STEAM LINE IN A PRESSURIZED WATER REACTOR

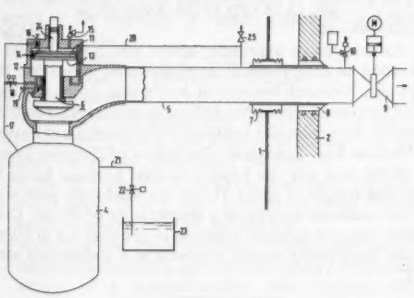
Jurgen Hoffmann; Albrecht Hofmockel, and Gunther Lepie, all of Erlangen, Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Mar. 3, 1975, Ser. No. 554,450

Claims priority, application Germany, Mar. 1, 1974, 2409867

Int. Cl.[2] G21C *9/00*

U.S. Cl. 176—38 **3 Claims**



1. In a pressurized water nuclear reactor having a safety vessel containing a steam generator from which a live steam line extends, a shut-off and safety device comprising valve means including a displaceable valve member connected in the live steam line within the safety vessel, and control piston means connected to said valve member for controlling opening and closing of said valve means, said control piston means comprising a control cylinder, a control member displaceable in said control cylinder and a piston rod connecting said control member to said valve member, said control member having a pair of opposite sides having working surfaces respectively subjectible to different pressure applied thereto in respective portions of said control cylinder located adjacent thereto for displacing said control member and said piston rod in respective directions so as to displace said valve member in corresponding directions to open and close said valve means, said piston rod being connected to the one working surface of said control member that is subjectible to a relatively greater steam pressure for opening said valve means, the portions of said control cylinder located adjacent the sides of said control member having means for effecting a pressure difference between the respective cylinder portions, means for changing said pressure difference so as to close said valve means in response to occurrence of a leak in the live steam line, means for limiting the pressure difference to a value dependent upon the highest permissible pressure in the steam generator, said valve member being displaceable by said highest permissible pressure in the steam generator to open said valve means, means for connecting both said control cylinder portions to the steam generator, throttling means connected in said connecting means for throttling steam pressure therein, the other working surface of said control member subjectible to a relatively greater steam pressure for closing said valve means having an area smaller than the total area of the one working surface of said control member inclusive of the area of the piston rod connected thereto, said pressure-difference changing means comprising a control line connecting the live steam line to the one portion of said control cylinder wherein pressure is applicable on said one working surface of said control member for opening said valve means whereby a pressure drop in the live steam line resulting from the occurrence of a leak therein reduces the pressure in said one portion of said control cylinder and closes said valve means, said pressure-difference limiting means comprising a safety valve connected to the other portion of said control cylinder wherein pressure is applicable on said other working surface of said control member for closing said valve means, whereby a pressure exceeding the highest permissible pressure in the steam generator increases the pressure in said other portion of said control cylinder through the respective connecting means thereto and activates said safety valve to relieve the pressure, said valve member being directly subjectible to steam pressure in the steam generator for opening said valve means so as to relieve pressure exceeding the highest permissible pressure in the steam generator in addition to said pressure-difference limiting means.

4,066,499

METHOD OF COOLING THE CEILING REFLECTOR IN A NUCLEAR REACTOR

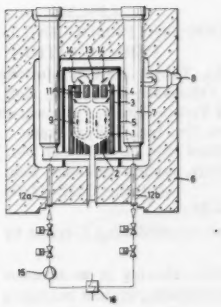
Hans-Peter Buthmann, Lippetal-Lippborg, Germany, assignor to Hochtemperatur-Kernkraftwerk GmbH (HKG) Gemeinsames Europaisches Unternehmen, Uentrop, Unna, Germany

Filed Apr. 26, 1976, Ser. No. 680,140

Claims priority, application Germany, Apr. 30, 1975, 2519273

Int. Cl.[2] G21C *9/00*

U.S. Cl. 176—38 **7 Claims**



1. A method for cooling the ceiling reflector in a shutdown gas-cooled, solid-moderated, high-temperature reactor using spherical fuel elements which are fed into the reactor core chamber through feed pipes extending through the ceiling

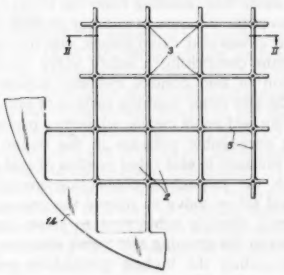
reflector of the core wherein during shutdown including terminating the feed of the fuel elements into the core and terminating the supply of gas coolant into and its removal from the core so that an amount of gas coolant remains in the core, comprising the steps of injecting a cooled gas through some of the feed pipes into the upper portion of the core chamber adjacent the ceiling reflector and removing the injected gas from the upper portion through the other feed pipes for establishing a flow of the cooled gas over the ceiling reflector within the upper region of the core chamber.

4,066,500

GRID LATTICE STRUCTURE

Klaus Woltron, Ternitz, and Peter Stuckler, Wiener Neustadt, both of Austria, assignors to Schoeller-Bleckmann Stahlwerke Aktiengesellschaft, Vienna, Austria

Filed Nov. 18, 1974, Ser. No. 524,891
Claims priority, application Austria, Nov. 16, 1973, 9641/73
Int. Cl.² G21C *3/34*
U.S. Cl. 176—78 **5 Claims**



1. In a nuclear reactor, in combination:

a plurality of substantially nondeformable parallel metal plates each forming an integral orthogonal array of strips defining between them a multiplicity of apertures whose dimensions substantially exceed the width of said strips, the apertures of all said plates being aligned with one another to seat a bank of elongate fuel-element containers transverse to said plates; and

a set of rigid stays transverse to said plates aligned with said strips and secured thereto for holding said plates at a fixed distance from one another.

4,066,501

METHOD FOR PRODUCING L-LYSINE BY FERMENTATION

Osamu Tosaka, Tokyo; Hajimu Morioka, Kawasaki; Hayao Hirakawa, Yokohama; Kenji Ishii; Koji Kubota, both of Kawasaki, and Yoshio Hirose, Fujisawa, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 770,692
Claims priority, application Japan, Feb. 20, 1976, 51-17518
Int. Cl.² C12D *13/06*
U.S. Cl. 195—29 **4 Claims**

1. A method for producing L-lysine by fermentation which comprises:

a. aerobically culturing in an aqueous culture medium an L-lysine producing mutant belonging to the genus Brevibacterium or Corynebacterium until L-lysine is accumulated in the culture medium, said mutant being resistant to α-amino-lauryllactam, α-methyl-lysine, or N$^{\omega}$-carbobenzoxy-lysine;

b. recovering the accumulated L-lysine from the culture medium.

4,066,502

METHOD OF PRODUCING CARBON SOURCE FOR FERMENTATION

Soichiro Asai, Tokyo; Tsutomu Matsuishi; Katsunobu Matsushita, both of Kawasaki; Shigeho Ikeda, Yokohama; Kaetsu Kobayashi, and Hiromasa Maruyama, both of Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Apr. 19, 1976, Ser. No. 678,116
Int. Cl.² C12D *13/06;* C12B *3/04*
U.S. Cl. 195—47 **5 Claims**

1. In the fermentation production of glutamic acid or lysine wherein fermentation is effected by the use of a microorganism of the genus Brevibacterium, Corynebacterium, Micrococcus or Microbacterium, the improvement which comprises:

admixing a substantially neutral hydrolyzate of molasses containing glucose and fructose cooled to below 10° C with calcium hydroxide to form a fructose addition product precipitate, and

neutralizing the remaining mother liquor, simultaneously eliminating calcium ions therefrom, and utilizing the remaining liquor as the carbon source for said fermentation.

4,066,503

ENZYME OF HYDROLYTIC ACTION, ENZYMATIC PREPARATION, METHOD FOR PREPARING BOTH AND THEIR USES

Alexandr Pavlovich Bashkovich, prospekt M. Toreza, 40, Korpus 7, kv. 21; Evgenia Semenovna Zimnukhova, ulitsa Pionerstroya, 18, kv. 206; Agnessa Vladimirovna Prokopovich, Bolsheokhtinsky prospekt, 79, kv. 9; Olga Grigorievna Polatovshaya, ulitsa Uchitelskaya, 19, korpus 1, kv. 29; Maria Ivanovna Pronina, ulitsa Sedova, 109, kv. 33; Valter Osvaldovich Kulbakh, Bukharestskaya ulitsa, 86, korpus 1, kv. 85; Khasya Ionovna Rivkina-Pevtsova, ulitsa Sadovaya, 92, kv. 5, and Grigory Efimovich Grinberg, prospekt Metallistov, 82, kv. 321, all of Leningrad, U.S.S.R.

Continuation of Ser. No. 666,503, March 12, 1976, abandoned, which is a division of Ser. No. 593,536, July 7, 1975. This application Nov. 8, 1976, Ser. No. 739,742
Int. Cl.² C12D *13/10;* A61K *37/54*
U.S. Cl. 195—62 **10 Claims**

1. An enzyme of hydrolytic action which is produced by cultivation of Streptomyces hygroscopicus, Strain No. 1913 (All-Union Research Institute of Antibiotics, Moscow, Collection of Cultures, Deposit No. 997) or its variant No. 149 (USSR Research Technological Institute of Antibiotics and Enzymes for Medical Use, Leningrad, Collection of Cultures, Deposit No. 0879), said enzyme being a neutral protease having the molecular weight of about 37,000, the isoelectric point at pH 8.8, the optimum activity at a temperature of 40°–45° C, the stability range in aqueous solutions at pH from 6.8 to 8.0, and quickly inactivating in said solutions at a temperature above 50° C.

4,066,504

ALIPHATIC DIALDEHYDE-AROMATIC POLYAMINE CONDENSATION PRODUCTS BOUND TO PROTEINS AND ENZYMES

Victor Krasnobajew, Zollikerberg, and Regula Böeniger, Greifensee, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 593,605, July 7, 1975, abandoned. This application Aug. 13, 1976, Ser. No. 714,153
Claims priority, application Switzerland, July 9, 1974, 9415/74; June 11, 1975, 7543/75
Int. Cl.² C12K *1/00*
U.S. Cl. 195—63 **16 Claims**

1. A process for the fixing or insolubilizing of proteins, which process comprises bonding a protein to a condensation product obtained according to the process which comprises reacting a carbocyclic, aromatic polyamine or 3-methylmercaptoaniline with an aliphatic dialdehyde having up to 6 car-

bon atoms or acrolein to give a condensation product suitable for the fixing or insolubilizing of proteins, excluding the manufacture of the 1,3-phenylenediamine-glutardialdehyde condensation product.

2. A process for the fixing or insolubilizing of enzymes, which process comprises bonding an enzyme to a condensation product obtained according to the process of claim 1.

4,066,505

PROCESS FOR EXTRACTING A POLYPEPTIDE FROM AN AQUEOUS SOLUTION

Michel Schneider, Grand-Lancy, Switzerland, assignor to Battelle Memorial Institute, Switzerland

Filed Mar. 16, 1976, Ser. No. 667,258

Claims priority, application Switzerland, Mar. 18, 1975, 3468/75

Int. Cl.² C07G *7/02, 7/00*

U.S. Cl. 195—66 R **8 Claims**

1. A process for extracting a polypeptide from an aqueous solution, in which a dissolved water-soluble macromolecular complex (I) of macromolecules covalently bonded to molecules of at least one compound capable of fixing the polypeptide in a selective, reversible and non-destructive manner, is selectively reacted with the polypeptide in the solution to fix the polypeptide by forming, in solution, a complex (II); and the complex (II) is separated from the solution, then dissociated into polypeptide molecules and complex (I) molecules, and the polypeptide is isolated.

4,066,506

METHOD OF SEPARATING AND PURIFYING TWO ACTIVE FORMS OF UROKINASE USING AFFINITY CHROMATOGRAPHY

Alan J. Johnson; Mercedes E. Soberano, both of New York; Eng Bee Ong, Elmhurst, and Milton Levy, Long Island City, all of N.Y., assignors to The United States of America as represented by the Secretary of Health, Education and Welfare, Washington, D.C.

Filed Oct. 8, 1976, Ser. No. 730,728

Int. Cl.² C07G *7/02;* **C12D** *13/10*

U.S. Cl. 195—66 B **14 Claims**

1. An affinity chromatography method for the separation and purification of two active forms of urokinase from a crude urokinase preparation, comprising the steps of:

a. preparing a solution of the crude urokinase preparation in a first buffer of low ionic strength of about 0.01 molar sodium phosphate buffer, pH 6.0–9.0;

b. contacting said crude urokinase solution with an extracting agent comprising agmatine covalently coupled to the surface of a water-insoluble solid support material whereby urokinase becomes preferentially adsorbed on said extracting agent;

c. washing said extracting agent with an additional amount of said first buffer so as to remove extraneous material from said extracting agent;

d. eluting a first active form of urokinase from said extracting agent with a second buffer having a slightly higher ionic strength than said first buffer, said first active form of urokinase being characterized by a molecular weight of approximately 33,400 and a specific activity of approximately 22,600 CTA units/mg protein; and

e. eluting a second active form of urokinase from said extracting agent with a third buffer having a higher ionic strength than said second buffer and containing an additional salt, said second active form of urokinase being characterized by a molecular weight of at least about 47,000 and a specific activity of at most about 104,000 CTA units/mg protein.

4,066,507

PROCESS FOR PRODUCING L-LEUPEPTINS

Kenkichi Takagi, Ageo; Yukio Yamamoto, Tokyo; Tadao Yamazaki, Yono; Hiroshi Yamaguchi, Urawa, and Hamao Umezawa, Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1976, Ser. No. 731,894

Int. Cl.² C12D *13/06*

U.S. Cl. 195—80 R **7 Claims**

1. A process for producing L-leupeptins, which comprises inoculating a leupeptins-producing strain of Streptomyces into one member selected from the group consising of (A) medium containing each 0.5 to 1.25% (wt/vol) of L-leucine, L-arginine (as hydrochloride), and glycine and (B) medium containing each 0.5 to 1.25% (wt/vol) of L-leucine, L-arginine (as hydrochloride), and glycine and 0.05 to 0.3% (wt/vol) of at least one member selected from the group consisting of yeast extract, casein hydrolyzate, and ribonucleic acids, cultivating aerobically said strain under the condition of pH 5.0 to 7.0 to produce and accumulate L-leupeptins in the medium, and extracting and purifying the L-leupeptins from the culture broth under the condition of pH 7.0 or less.

4,066,508

PROCESS AND REAGENT FOR DETERMINING TRIGLYCERIDES

Elli Rauscher; Erich Bernt, both of Munich; Wolfgang Gruber, Tutzing-Unterzeismering, and Helmut Determann, Starnberg, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

Filed July 21, 1976, Ser. No. 707,455

Claims priority, application Germany, Aug. 12, 1975, 2535953

Int. Cl.² C12K *1/00*

U.S. Cl. 195—99 **16 Claims**

10. Reagent for the determination of triglycerides, comprising lipase, carboxylesterase, an alkali metal or alkaline earth metal alkyl sulfate of from 10 to 15 carbon atoms in the alkyl radical, a buffer, a system for the detection of glycerol, and a compound of the general formula $RO(CH_2CH_2O)_nH$ wherein R is alkyl or alkenyl of from 14 to 20 carbon atoms and *n* is an integer of from 7 to 20.

4,066,509

DETECTION OF HYDROLYZING ENZYMES

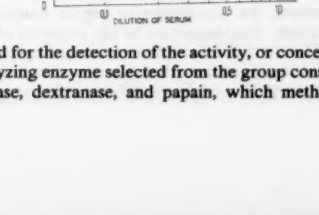
Miroslav Ceska, Uppsala, Sweden, assignor to Boehringer Mannheim GmbH, Mannheim, Germany

Continuation of Ser. No. 178,671, Sept. 3, 1971, abandoned. This application Feb. 8, 1974, Ser. No. 440,944

Claims priority, application Sweden, Sept. 11, 1970, 12379/70

Int. Cl.² G01N *31/14*

U.S. Cl. 195—103.5 R **3 Claims**



1. Method for the detection of the activity, or concentration, of a hydrolyzing enzyme selected from the group consisting of alpha-amylase, dextranase, and papain, which method com-

prises applying a solution of said hydrolyzing enzyme onto a detection layer consisting essentially of a carrier matrix gel inert to the enzyme and permitting diffusion of substrate fragments therein and, dispersed throughout said matrix gel, a dyed intermolecularly cross-linked substrate selected from the group consisting of starch, dextran, cellulose and albumin, cross-linked with a diepoxide to render the substrate insoluble in the matrix gel, and measuring the size of an unmarked area formed in said gel due to fragmentation and diffusion of the dyed substrate by action of the enzyme thereon, as a measure of the amount of concentration of said enzyme.

4,066,510

ASSAY FOR MUTAGENESIS IN DIPLOID HUMAN LYMPHOBLASTS

William G. Thilly, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 24, 1976, Ser. No. 689,432
Int. Cl.[2] C12K *1/00*
U.S. Cl. 195—103.5 R **10 Claims**

1. An assay for determining mutagenesis, comprising:
   a. exposing a culture of human diploid or near-diploid cells capable of continuous division in suspension culture and having one active x-chromosome which carries the gene for HGPRT to an agent to be tested for its mutagenic effects on said cells;
   b. incubating exposed cells for a number of generations sufficient to allow full expression of phenotypically-developed resistance to a purine which acts as an HGPRT substrate; and then,
   c. detecting the amount of mutant cells to thereby determine the degree of mutagenesis.

4,066,511

ANALYTIC DEVICE AND METHOD

Paul A. F. Montagnon, La Balme-les-Grottes Isere, France

Filed Aug. 11, 1975, Ser. No. 603,383
Claims priority, application France, Aug. 12, 1974, 74.28639
Int. Cl.[2] C12K *1/04*
U.S. Cl. 195—103.5 M **3 Claims**

1. An analytical testing kit adapted to detect the presence of at least one of a plurality of different predetermined microorganisms in a test specimen comprising:
   a. a tubular receptacle having a portion therein containing a liquid medium having both nutrients for enabling the growth of microorganisms of the specimen when disposed therein and a first predetermined reagent which can react with a predetermined microorganism of the plurality to give an indication, the tubular receptacle additionally having means for sealing the liquid medium within the tube; and
   b. an elongated test strip adapted to be inserted into the tubular receptacle when the sealing means is removed, the test strip having
      1. at least one liquid-reactive region adjacent one end portion of the strip adapted to be immersed in the liquid medium, the liquid-reactive region containing other nutrients complementary to the nutrients of the liquid medium and a second predetermined reagent which can react to give an indication when another predetermined microorganism of the plurality is cultured in the liquid medium, the second predetermined reagent being incapable of inhibiting the growth of the plurality of different microorganism and being non-toxic to the plurality of microorganisms; and
      2. at least one vapor-reactive region, the vapor-reactive region being adapted to be disposed out of the liquid medium when the liquid-reactive region is immersed in the liquid medium, said vapor-reactive region containing a third predetermined reagent which can react to give an indication when contacted with a predetermined vapor emitted from the liquid medium in response to the presence of a predetermined microorganism of the plurality of microorganisms.

3. A process for detecting the presence of at least one of a plurality of different predetermined microorganisms in a test specimen by use of a tubular receptacle having a portion therein containing a liquid medium having both nutrients for enabling the growth of microorganisms of the specimen when disposed therein and a first predetermined reagent which can react with a predetermined microorganism of the plurality to give an indication, the tubular receptacle additionally having means for sealing the liquid medium within the tube, and an elongated test strip adapted to be inserted into the tubular receptacle when the sealing means is removed, the test strip having at least one liquid-reactive region adjacent one end portion of the strip adapted to be immersed in the liquid medium, the liquid-reactive region containing other nutrients complementary to the nutrients of the liquid medium and a second predetermined reagent which can react to give an indication when another predetermined microorganism of the plurality is cultured in the liquid medium, the second predetermined reagent being incapable of inhibiting the growth of the plurality of different microorganism and being non-toxic to the plurality of microorganisms, and at least one vapor-reactive region, the vapor-reactive region being adapted to be disposed out of the liquid medium when the liquid-reactive region is immersed in the liquid medium, said vapor-reactive region containing a third predetermined reagent which can react to give an indication when contacted with a predetermined vapor emitted from the liquid medium in response to the presence of a predetermined microorganism of the plurality of microorganisms, the process comprising the steps of:
   a. placing the test specimen into the liquid medium in the tubular receptacle, the nutrient in the liquid medium enabling the test specimen to be cultured,
   b. placing the elongated test strip into the tubular receptacle when the sealing means is removed with the liquid-reactive region of the test strip immersed in the liquid medium and the vapor-reactive region disposed out of the liquid medium,
   c. permitting the test specimen to be cultured, to react with any one of the first and second reagents, and any vapor from the liquid medium to react with the third reagent,
   d. sensing the liquid medium for a possible indication by the first reagent,
   e. further sensing the liquid-reactive portion of the test strip for possible indication by the second reagent,
   f. additionally sensing the vapor-reactive region of the test strip for possible indication by the third reagent, and
   g. compiling the results of the steps of (c), (d), and (e) for determining the presence of at least one of a plurality of different predetermined microorganisms.

4,066,512

BIOLOGICALLY ACTIVE MEMBRANE MATERIAL

Chung Jung Lai, Watertown, and Stanley M. Goldin, Norwood, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Continuation of Ser. No. 503,624, Sept. 6, 1974, abandoned. This application May 10, 1976, Ser. No. 684,746
Int. Cl.[2] C07G *7/00, 7/02*; G01N *31/14*
U.S. Cl. 195—127 **18 Claims**

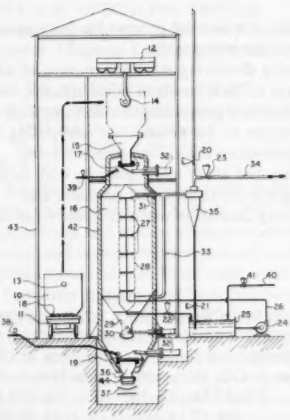
1. A composite membrane structure for immobilizing biolog-

ically active proteinaceous materials comprising a thin microporous membrane having capillary pore sizes in the range from about 25 nanometers to 14 micrometers, said membrane being formed from a biologically inert synthetic polymer, said membrane having a thin, water-insoluble coating of an inert proteinaceous material on its surfaces, said coating being formed by (a), soaking the membrane with a solution of the proteinaceous material in an organic solvent, and (b), drying to form a thin layer of said inert proteinaceous material such that the coated membrane retains its intercommunicating capillary pores that extend through its structure, to permit fluid flow therethrough, and that provide a high surface-to-volume ratio, said coated membrane being capable of stably immobilizing a biologically active proteinaceous material thereon with retention of its activity upon contacting the coated membrane with a solution in which the biologically active material is dissolved, and drying.

4,066,513
COKE QUENCHING STEAM GENERATOR

Richard Jablin, 1438 Manor Lane, Blue Bell, Pa. 19422

Filed Apr. 6, 1976, Ser. No. 674,299
Int. Cl.² C10B *39/04*
U.S. Cl. 201—39 **13 Claims**



1. A batch process for quenching incandescent coke and producing steam at superatmospheric pressure, comprising:

a. feeding the coke into the top of a vertically disposed pressure vessel to substantially fill said vessel with a stationary batch of coke;

b. sealing said vessel sufficiently to contain steam at superatmospheric pressure;

c. spraying water radially outwardly into said batch of coke through a plurality of nozzles disposed within and surrounded by said batch of coke to directly quench said coke and produce steam;

d. when said steam has reached a predetermined level of superatmospheric pressure, opening a steam discharge valve and delivering steam from said vessel through said valve at superatmospheric pressure;

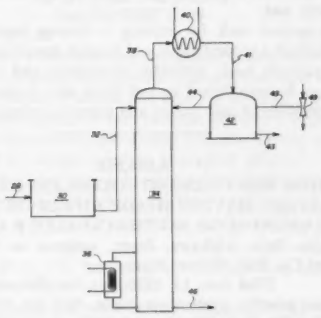
e. when said quenched coke has fallen to a predetermined temperature, discontinuing said spraying, closing said steam discharge valve, and opening a steam vent valve to release the pressure in said vessel; and

f. after the pressure in said vessel has fallen to approximately atmospheric pressure, discharging said batch of coke through the bottom of said vessel.

4,066,514
RECOVERY OF NITRATED COMPOUNDS FROM WATER BY DISTILLATION

Frank C. Fowler, Kansas City, Mo., assignor to Atlas Powder Company, Dallas, Tex.

Filed Sept. 9, 1976, Ser. No. 721,773
Int. Cl.² B01D *3/10;* **C07C** *77/02*
U.S. Cl. 203—11 **7 Claims**



1. A method for separating nitrated esters from a water solution which contains less than about 1 weight percent of nitrated esters of polyalcohols having from about 2 to about 3 carbon atoms comprising:

a. passing said water solution into a distillation zone and heating said water to a temperature of from about 50° to about 200° F at a lower than atmospheric pressure in the range of from about 10 to about 500 mm of mercury;

b. withdrawing a vapor stream comprising said nitrated esters and water from the top of said distillation zone;

c. cooling said vapor stream in a cooling zone to condense said water and said nitrated esters to form a water phase and a nitrated ester phase;

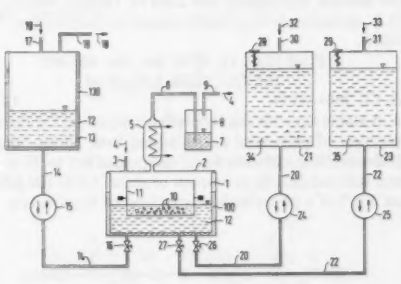
d. separating said condensed water phase from said nitrated ester phase;

e. withdrawing the bottom product of said distillation zone which comprises water which is substantially free of said nitrated esters.

4,066,515
APPARATUS AND METHOD FOR THE ELECTRODEPOSITING OF ALUMINUM

Klaus Stoger; Richard Dotzer, both of Nurnberg, and Johann Gehring, Spardorf near Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 12, 1976, Ser. No. 713,984
Claims priority, application Germany, Aug. 21, 1975, 2537285
Int. Cl.² C25D *5/00, 5/04*
U.S. Cl. 204—14 N **10 Claims**



1. Apparatus for electrodepositing aluminum from aprotic,

oxygen-free and water-free organo-aluminum electrolytes, comprising:

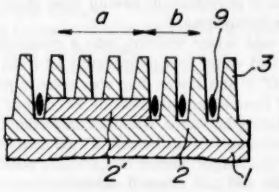
a. a heated treatment tank;
b. means to close said tank airtight;
c. means to admit an inert gas to said tank;
d. a rotatable electroplating drum arranged within said treatment tank;
e. a first tank for storing the electrolyte connected through a first valve and first pumping means to the treatment tank; and
f. a second tank for storing a rinsing liquid connected through a second valve and second pumping means to the treatment tank, whereby electrolyte and rinsing liquid may be transferred to and from said treatment tank by operation of said valves and pumping means.

4,066,516

METHOD FOR FORMING COLORLESS OR COLORED PATTERN HAVING SHADE DIFFERENCE ON AN ALUMINUM OR ALUMINUM ALLOY ARTICLE

Toshihiko Sato, Ichikawa, Japan, assignor to Nippon Light Metal Co., Ltd., Tokyo, Japan

Filed June 11, 1976, Ser. No. 695,143
Claims priority, application Japan, June 27, 1975, 50-79334; July 15, 1975, 50-86280; Nov. 14, 1975, 50-136285
Int. Cl.[2] C25D *11/04, 11/12, 11/14, 11/22*
U.S. Cl. 204—15 **14 Claims**



1. A method of forming a colored pattern on an aluminum or aluminum alloy article which comprises:

A. anodically oxidizing said article at a voltage of from 10–120 volts;
B. forming a barrier layer on those areas not to be colored by subjecting said areas to a second anodic oxidation at a voltage of from 15–200 V wherein said voltage is at least 5 volts greater than the voltage applied in Step A; and
C. electrolytically coloring said article utilizing an electrolytic metal salt bath at a voltage of from 5–75 volts wherein only those areas not subjected to said second anodic oxidation are colored.

4,066,517

ELECTRODEPOSITION OF PALLADIUM

Peter Stevens, Parsippany, and John M. Deuber, Nutley, both of N.J., assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Mar. 11, 1976, Ser. No. 666,093
Int. Cl.[2] C25D *3/52, 3/56*
U.S. Cl. 204—43 N **12 Claims**

1. A stable aqueous electroplating bath useful for the electrodeposition of palladium or palladium base alloys comprising palladosammine chloride in an amount of 0.1 to 50 g/l palladium, sulfonic acid in an amount of about 1.0 to 100 g/l, and at least 5 g/l of a phosphonic compound of the formula:

$$[(MO)_2-\overset{O}{\overset{\|}{P}}-R'\frac{}{}_{2}N-R-N-\frac{}{}[R'-\overset{O}{\overset{\|}{P}}-(OM)_2]_2$$

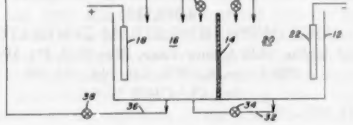
wherein R is an alkylene group of 2 - 6 carbon atoms, each R' is an alkylene group of 1 to 4 carbon atoms, and each M is a non-deleterious cationic moiety,
said bath exhibiting a pH value of from 7.0–10.0.

4,066,518

PRODUCTION OF POTASSIUM OR SODIUM STANNATE

Richard E. Horn, Pittsburgh, Pa., assignor to Pitt Metals and Chemicals, Inc., Pittsburgh, Pa.

Filed Aug. 20, 1976, Ser. No. 716,234
Int. Cl.[2] C25B *1/00*
U.S. Cl. 204—86 **13 Claims**



1. An electrochemical process for the manufacture of alkali metal stannates comprising,

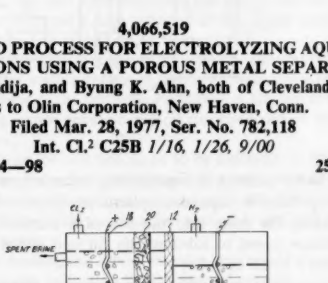
anodically dissolving stannous tin into an alkali metal electrolyte to form an alkali metal stannite,
simultaneously preventing the stannite from migrating from the anode to the cathode by interposing therebetween a permselective ion exchange membrane,
oxidizing said alkali metal stannite with an oxygen containing gas to an alkali metal stannate, and
recovering said alkali metal stannate from said electrolyte.

4,066,519

CELL AND PROCESS FOR ELECTROLYZING AQUEOUS SOLUTIONS USING A POROUS METAL SEPARATOR

Igor V. Kadija, and Byung K. Ahn, both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 28, 1977, Ser. No. 782,118
Int. Cl.[2] C25B *1/16, 1/26, 9/00*
U.S. Cl. 204—98 **25 Claims**



1. A cell for electrolyzing alkali metal chloride solutions comprised of an anode compartment, a foraminous metal anode in said anode compartment, a cathode compartment, a cathode in said cathode compartment, a cation permeable divider separating said anode compartment from said cathode compartment, and a porous metal separator positioned in the anode compartment between said foraminous metal anode and said cation permeable divider.

4,066,520
SLURRY ELECTROWINNING PROCESS

Robert C. Emmett, Jr., Salt Lake City, Utah; James K. Dicksa, Antioch, Calif.; Bruce C. Wojcik, Salt Lake City, and Frank A. Baczek, Sandy, both of Utah, assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Sept. 1, 1976, Ser. No. 719,867
Int. Cl.[2] C25C *1/12, 7/00;* C01G *3/00*
U.S. Cl. 204—108 30 Claims

1. A method of leaching an aqueous slurry of copper-bearing solids to remove non-copper metal ions in order to produce a suitable feed of solids for an electrowinning cell which comprises the steps of:

a. leaching said copper-bearing solids with a moderately strong aqueous acid to solubilize metal ions into solution in the aqueous acid;

b. then adding calcium sulfite to the aqueous acid solution to reduce the copper ion concentration by forming copper-precipitate solids therein;

c. then separating the copper-precipitate solids and any remaining portions of said copper-bearing solids from the aqueous acid solution, thereby to form a first stream comprising clear liquid and a second stream comprising a slurry containing said copper-precipitate solids and remaining portion of said copper-bearing solids.

4,066,521
METALLIC DESCALING SYSTEM

Donald R. Zaremski, Cheswick, Pa., and Albert Krepler, Vienna, Austria, assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Feb. 9, 1977, Ser. No. 767,177
The portion of the term of this patent subsequent to May 31, 1994, has been disclaimed.
Int. Cl.[2] C25F *1/06, 1/02*
U.S. Cl. 204—141.5 5 Claims

1. A process for descaling a heated metallic body, which comprises the steps of: immersing said body in a bath of molten oxidizing salt; maintaining said bath at a temperature above its melting point during said immersion, said immersion being for a period of more than 2 and less than 30 seconds; removing said body from said bath after scale on said body has been conditioned for subsequent removal; subsequently immersing said body in an electrolyte of an aqueous solution of at least one neutral salt from the group consisting of the chloride, sulfate and nitrate of an alkali metal or ammonium; passing an electric current through said body and electrolyte for a period of at least 4 seconds; and removing said body from said electrolyte.

4,066,522
PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT ACRYLAMIDE POLYMERS

Sueo Machi, Takasaki; Takeshi Wada, Ibaragi, and Hiroshi Sekiya, Takasaki, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Jan. 14, 1976, Ser. No. 649,021
Claims priority, application Japan, Jan. 16, 1975, 50-7222
Int. Cl.[2] C08F *2/46, 4/08*
U.S. Cl. 204—159.24 12 Claims

4. A process for the production of high molecular weight acrylamide polymers which comprises irradiating a solution comprising 5 – 60% by volume of water, 5 – 50% by volume of an acrylamide monomer and the balance volume of acetone with an ionizing radiation at a dose rate ranging from 10 through 10^6 roentgens/hour at a temperature in the range of −20° C through 50° C in the presence of an alkaline salt in an amount ranging from about 0.01 through about 10 mol % based on the total amount of monomer or monomers to be polymerized.

4,066,523
DUAL CURE CATHODIC ELECTROCOATING COMPOSITION

Vincent D. McGinniss, Valley City, Ohio, assignor to SCM Corporation, New York, N.Y.

Division of Ser. No. 658,269, Feb. 17, 1976, Pat. No. 4,025,409, which is a continuation-in-part of Ser. No. 708,106, July 23, 1976, Pat. No. 4,035,272, which is a continuation-in-part of Ser. No. 595,448, July 14, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 781,661
Int. Cl.[2] C08F *8/00*
U.S. Cl. 204—159.15 8 Claims

1. A cathodic electrocoating composition dispersed in an aqueous electrocoating bath for electrodeposition onto a cathode substrate disposed within said bath for forming a curable electrodeposited coating on said cathode substrate comprising:

a. a water-dispersed electrocoating polymer having at least about 1% by weight pendant mercaptan groups;

b. a water-dispersed electrocoating polymer having at least about 1% by weight pendant tertiary amine groups, each said amine group being attached to an alpha carbon of said polymer;

c. at least about 5% bis-maleimide cross-linking agent by weight of said polymers; and,

d. at least about 0.5% ultraviolet photosensitizer by weight of said polymers;

said pendant amine groups and said pendant mercaptan groups together comprising at least about 5% by weight of said polymers, said electrodeposited coating of said electrocoating composition adapted to cure by heating said electrodeposited coating on said cathode substrate to cross-link said mercaptan groups with said bis-maleimide to partially cure said coating followed by irradiating with ultraviolet radiation said partially cured coating to cross-link said alpha carbon of said polymer having said pendant amine groups with said bis-maleimide to fully cure said coating on said cathode substrate.

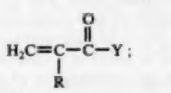
4,066,524
IMIDAZOLE POLYMERS AND PREPARATION THEREOF WITH RADIATION AND CHEMICAL INITIATOR

Charalambos J. Phalangas, Princeton Junction, N.J., assignor to Hercules Incorporated, Wilmington, Del.

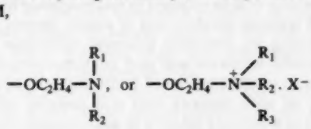
Continuation of Ser. No. 357,357, May 4, 1973, abandoned. This application Aug. 18, 1975, Ser. No. 605,799
Int. Cl.[2] C08F *2/46, 4/04, 4/34*
U.S. Cl. 204—159.23 11 Claims

1. A process of preparing water-soluble, high molecular weight imidazole polymers which comprises

irradiating an aqueous solution comprising from 15% to about 90% by weight of monomer comprising from 5% to 100% by weight of at least one water-soluble imidazole monomer selected from the group consisting of 1-vinylimidazole, acid salt of 1-vinylimidazole, and quaternary salt of 1-vinylimidazole and from 95% to 0% by weight of at least one water-soluble monomer conforming to the formula



wherein R is hydrogen, methyl, or ethyl and Y is $-NH_2$, $-OM$,



wherein M is a cation, R_1, R_2 and R_3 are 1 to 4 carbon alkyl groups, and X is an anion, and

from about 100 to about 12,000 ppm of a chemical, free-radical initiator for the polymerization of ethylenically unsaturated compounds,

said initiator having a dissociation rate constant above about 1×10^{-4} reciprocal seconds at 100° C., does not substantially catalyze the polymerization of ethylenically unsaturated monomers at temperatures below about 50° C., and does substantially catalyze the polymerization of ethylenically unsaturated monomers at temperatures below about 100° C.,

with high energy ionizing radiation at an intensity of from about 10,000 rads to about 1,000,000 rads per hour to a dose of from about 5,000 to about 500,000 rads,

to form a reaction mass in which from about 30% to about 95% by weight of the monomer initially present in aqueous solution has been converted to water-soluble polymer and in which chemically induced polymerization occurs,

terminating the high energy ionizing radiation of the reaction mass before formation of water-insoluble polymer in the reaction mass, and allowing the chemically induced polymerization of the reaction mass to continue.

4,066,525

CATHODIC ELECTROCOATING PROCESS

James T. K. Woo, Medina, and James M. Evans, Olmsted Falls, both of Ohio, assignors to SCM Corporation, Cleveland, Ohio

Filed Dec. 22, 1975, Ser. No. 642,694
Int. Cl.[2] C25D *13/06*
U.S. Cl. 204—181 **7 Claims**

1. A process for cathodically electrocoating a metallic substrate to form a cured resinous coating thereon, said process comprising

A. establishing simultaneous contact of said metallic substrate and a counter-electrode with a body of liquid aqueous dispersion having dispersed therein

a. a cathodically electrodepositable, at least partially cationized binder resin comprising a major proportion by weight of a reaction product of an epoxide-functional resin and a monoamino alcohol or phenol having at least one reactive hydrogen on the amino nitrogen, said reaction product being substantially devoid of reactive epoxide groups and having an average of at least about 2 reactive hydroxyl groups and at least about 0.2 directly or indirectly pendant 5 to 20 carbon atom hydrocarbon radical per molecule,

b. from about 0.05 to 1 weight parts, per weight part of said binder resin, of an acid-functional aminoplast resin (i) cathodically co-electrodepositable with said binder resin from said aqueous dispersion to form an intermediate product comprising an intimate mixture of the cathodically electrodeposited forms of said binder resin and said aminoplast resin, (ii) co-reactive in said intermediate product with the cathodically electrodeposited form of said binder resin upon heating, to transform said intermediate product into a cured resinous product, (iii) having at least about 0.0001 equivalent of titratable acid functionality of pK_a not greater than about 5 per gram of said aminoplast resin, and (iv) not soluble in the aqueous medium of said dispersion, and

c. from about 20 to 150 milliequivalents, per 100 grams of (a) and (b), of an anion of a water-soluble acid to induce and stabilize the cationization of said binder resin, said aqueous dispersion having a pH of from about 2 to about 7 and being substantially free of any water-soluble acid which will be retained in water-soluble form in said cured resinous product and of anions thereof;

B. maintaining an electrical potential difference between said metallic substrate and said counter-electrode, while both are in contact with said body of liquid aqueous dispersion, of such polarity that said metallic substrate is charged as a cathode relative to said counter-electrode as an anode and of such magnitude that an uncured coating comprising said intermediate product is cathodically electrodeposited upon said metallic substrate;

C. removing said metallic substrate bearing said uncured coating thereon from contact with said body of liquid aqueous dispersion; and

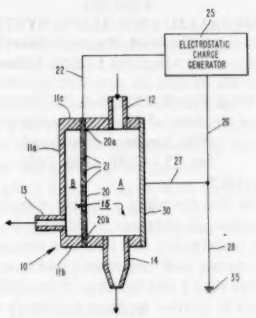
D. thereafter heating said uncured coating to transform it into a cured resinous coating comprising said cured resinous product.

4,066,526

METHOD AND APPARATUS FOR ELECTROSTATIC SEPARATING DISPERSED MATTER FROM A FLUID MEDIUM

George Chiayou Yeh, Smedley Drive, R.D. 1, Newtown Square, Pa. 19073

Filed Aug. 19, 1974, Ser. No. 498,423
Int. Cl.[2] B03C *5/00*
U.S. Cl. 204—186 **8 Claims**



1. Method for separating dispersed matter consisting essentially of electrostatically-charged finely-divided particles from a fluid medium containing same, said method comprising:

A. Continuously introducing said fluid medium containing the dispersed matter into a non-collecting separation chamber in the zone adjacent a first side of a separating electrode which divides said chamber into two zones and which is pervious to the passage of said fluid and dispersed matter;

B. Continuously subjecting said introduced fluid medium containing dispersed matter to the field of a dense and uniformly-distributed corona discharge occurring from said separating electrode, said separating electrode containing an electrostatic charge of the same polarity as that of the charge on said finely-divided particles and of a magnitude sufficient substantially to repel said finely-divided particles, whereby said finely-divided particles are selectively repelled from said separating electrode;

C. Continuously passing through said separating electrode and withdrawing from the zone adjacent the reverse side of said separating electrode fluid medium containing a reduced concentration of said finely-divided particles; and

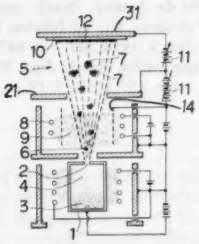
D. Continuously withdrawing from the zone adjacent said first side of said separating electrode a fluid medium containing an increased concentration of said finely-divided particles.

4,066,527

METHOD OF PRODUCING SEMICONDUCTOR DEVICE

Toshinori Takagi, Nagaokakyo; Kiyoshi Morimoto, and Yukihiko Utamura, both of Mobara, all of Japan, assignors to Futaba Denshi Kogyo K. K., Japan

Filed July 15, 1976, Ser. No. 705,713
Claims priority, application Japan, July 18, 1975, 50-87255; July 18, 1975, 50-87256
Int. Cl.² C23C *15/00*
U.S. Cl. 204—192 N 14 Claims



1. A method of producing a semiconductor device comprising the sequential steps of:

providing a substrate made of a material easy to cleave and easy to dissolve in a preselected solvent so that film layers having excellent crystalline properties and oriented by the crystal axis of the substrate may be made to grow on a cleavage plane of said substrate;

vaporizing a first material-to-be-deposited to form a first vapor;

injecting said first vapor into a vacuum region which is at most 10^{-2} Torr and at about 1/100 or less of the pressure of said first vapor to form aggregates of atoms of said first vapor called first clusters;

bombarding said first clusters with electrons to ionize at least a part of said first clusters thereby forming ionized first clusters;

accelerating said ionized first clusters by an electric field to bring them into collision with said substrate thereby forming a first crystalline film layer thereon;

vaporizing a second material-to-be-deposited to form a second vapor;

injecting said second vapor into a vacuum region which is at most 10^{-2} Torr and at about 1/100 or less of the pressure of said second vapor to form aggregates of atoms of said second vapor called second clusters;

bombarding said second clusters with electrons to ionize at least a part of said second clusters thereby forming ionized second clutsters;

accelerating said ionized second clusters by an electric field to bring them into collision with said first crystalline film layer to form a second crystalline film layer thereon, thereby forming a laminated element film portion of said device;

separating said laminated element film portion from said substrate by dissolving the substrate material in said preselected solvent; and

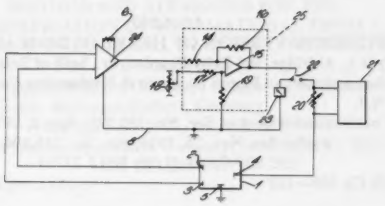
furnishing said laminated element film with suitable electrodes to form said semiconductor device.

4,066,528

ANALYTICAL APPARATUS

John Rickard Mansfield, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed July 19, 1976, Ser. No. 706,555
Claims priority, application United Kingdom, July 30, 1975, 31927/75
Int. Cl.² G01N *27/44*
U.S. Cl. 204—195 T 6 Claims



1. Apparatus for carrying out coulometric analysis which comprises:

a. an instrumentation amplifier which acts as a differential to single ended potential convertor having a high input impedance,

b. a coulometric cell having a sensor electrode, a reference electrode, and a generator electrode and means for feeding (a) with the potential between the sensor and reference electrodes of said coulometric cell,

c. a differential potential input amplifier fed by (a) and by means for setting the output current of (c) to zero at a desired potential difference between the sensor and reference electrodes by feeding a suitable offset potential to (c), the whole apparatus excluding the coulometric cell having a phase shift of less than 90° and responding to direct or low frequency electromotive force input signals.

4,066,529

METHOD OF DESIGN FOR VERTICAL OIL SHALE RETORTING VESSELS AND RETORTING THEREWITH

Adam A. Reeves, Rifle, Colo., assignor to Paraho Corporation, Grand Junction, Colo.

Filed May 7, 1976, Ser. No. 684,001
Int. Cl.² C10G *1/02*
U.S. Cl. 208—11 R 7 Claims

1. In a process of contacting a particulate oil shale with a gaseous treating agent is a vertical shaft vessel, wherein a gravity flow of particulate oil shale passes through said vessel maintaining a constant bed depth by feeding raw oil shale at the top and removing treated particulate oil shale at the bottom, and a first gas stream for treatment is introduced into the bottom of the particulate oil shale, at least a second gas stream is introduced through orificed distributors at a temperature of up to about 1,400° F at a position intermediate the top and bottom of the bed of oil shale to cause pyrolysis of the same and off-gas is withdrawn from the vessel above said at least second gas injection the improvement comprising:

a. establishing a total flow of gas through the vessel of from 8,000 to 25,000 standard cubic feet of gas per ton of particulate oil shale;

b. proportioning said gases between a first point of introduction adjacent the bottom of the bed and into at least a second point of introduction located between the top and bottom of the bed, wherein a plurality of orifices spread the gas across the lateral extent of the bed, said orifices being fed by a stream of gas in a distributor conduit at a velocity of Vi feet per second;

c. providing a sufficient quantity of the gas introduced at the bottom of the bed so that it flows upwardly through the bed a velocity of Vg in feet per second, calculated on the basis of an empty vessel;

d. providing a quantity of gas through each said orifice at a sufficient velocity Vh of gas issuing from said orifices so as to mix with the uprising flow of gas from the bottom of the bed at a velocity Vh in the range of 80–100 feet per second; and

e. proportioning the velocities of the introduced gases so that the ratio Vh/Vi is at least 2 and the ratio of Vh/Vg is at least 15 to control contact velocity between the gases and the particulate oil shale.

4,066,530

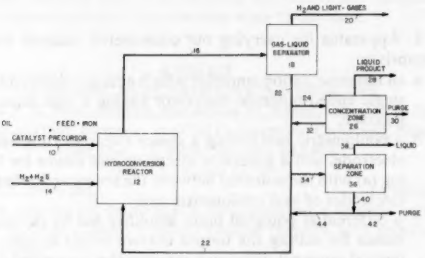
HYDROCONVERSION OF HEAVY HYDROCARBONS

Clyde L. Aldridge, and Roby Bearden, Jr., both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 702,227, July 2, 1976. This application Nov. 26, 1976, Ser. No. 745,394

Int. Cl.[2] C10G *13/06;* B01J *27/04*

U.S. Cl. 208—112 **33 Claims**



1. A process for hydroconverting a heavy hydrocarbon oil chargestock, which comprises: reacting a heavy hydrocarbon oil chargestock containing a catalyst with hydrogen at hydroconversion conditions in a hydroconversion zone, said catalyst comprising an effective amount of an iron component and a catalytically active metal component selected from the group consisting of Group VB, Group VIB, Group VIIB, Group VIII metals other than iron, of the Periodic Table of Elements, and mixtures thereof, said iron component being added to said oil chargestock as solid particles, and said catalytically active metal component having been prepared by the steps of:

a. adding to said heavy hydrocarbon oil chargestock an effective amount of an oil soluble metal compound, said metal being selected from the group consisting of Group VB, Group VIB, Group VIIB and Group VIII metals other than iron, of the Periodic Table of Elements, and mixtures thereof, and

d. converting said oil-soluble metal compound to a catalytically active metal component within said chargestock in the presence of a hydrogen-containing gas.

4,066,531

PROCESSING HEAVY REFORMATE FEEDSTOCK

Hartley Owen, Belle Mead; Paul B. Venuto, Cherry Hill, and Edward J. Rosinski, Pedricktown, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 26, 1975, Ser. No. 616,964

Int. Cl.[2] C10G *11/02*

U.S. Cl. 208—120 **8 Claims**

1. A process for converting a heavy reformate feedstock having an initial boiling point between about 230° F and about 250° F and an end point between about 350° F and about 430° F into (a) liquid product rich in benzene, toluene and xylene and having a substantially lower midboiling point than said heavy reformate feedstock and (b) gaseous product rich in light olefins and isoparaffins which comprises contacting said feedstock in the absence of added hydrogen with a porous acid-active zeolite catalyst having a fluid activity index of at least about 18 and being selected from the group consisting of ZSM-11, ZSM-12, ZSM-35, ZSM-38 and dealuminized mordenite, in a fluidized catalyst system reactor with a reactor inlet temperature of between about 800° F and about 1200° F, a reactor pressure of between about 2 psig and about 100 psig, a catalyst/oil weight ratio of between about 0.5 and about 40, a catalyst residence time of between about 0.1 second and about 20 seconds, a feedstock residence time of between about 0.1 second and about 20 seconds and a slip ratio of between about 1 and about 2.

4,066,532

PROCESS FOR PRODUCING PREMIUM COKE AND AROMATIC RESIDUES FOR THE MANUFACTURE OF CARBON BLACK

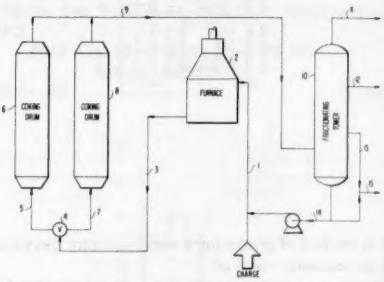
Roberto Garcia, Rio de Janeiro, Brazil, assignor to Petroleo Brasileiro S.A. Petrobras, Rio de Janeiro, Brazil

Filed Jan. 9, 1976, Ser. No. 647,673

Claims priority, application Brazil, June 30, 1975, 7504079

Int. Cl.[2] C10G *9/14*

U.S. Cl. 208—131 **3 Claims**



1. A process for producing premium coke and aromatic residue for the manufacture of carbon black which comprises using as a feed charge a mixture of 10% to 50% coal tar, said coal tar having the characteristic that the first 50% of its volume boils between 80° C and 500° C, and 90% to 50% decanted thermal or catalytic cracking oil, said mixture containing low Na, Fe, Cu, V and silicate values so that the ash value thereof is less than 0.15% by weight, the sulphur value is less than 3.5% and the asphaltene content is less than 8%; and submitting said charge to heating in a furnace and then leading it to coking drums where it undergoes delayed coking at a temperature between 450° C and 510° C., at a pressure of 1.7 to 4.0 manometric atmospheres, so as to produce premium coke and a top product, and then fractionating said top product to provide a heavy oil having high aromatic values, said heavy oil being useful as a raw material for producing carbon black.

4,066,533

SEPARATION OF CATALYST FROM EFFLUENT OF A FLUIDIZED CATALYTIC HYDROCARBON CONVERSION PROCESS

George D. Myers; Paul W. Walters, both of Ashland, and Robert L. Cottage, Catlettsburg, all of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

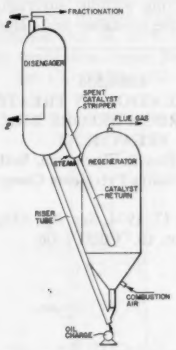
Continuation-in-part of Ser. No. 561,625, March 24, 1975, abandoned. This application Nov. 26, 1976, Ser. No. 744,998

Int. Cl.[2] C10G *11/18*

U.S. Cl. 208—153 **5 Claims**

1. In a method for the fluid catalytic cracking of petroleum hydrocarbons wherein an ascending essentially cocurrent flow of the vaporous hydrocarbon feedstock and catalyst particulates is effected in an elongated tubular reaction zone; the improvement of separating the catalyst particulates from the cracked hydrocarbon stream which comprises discharging said particulates alone by virtue of the inertial momentum asso-

ciated therewith directly into a catalyst disengaging zone in which there is essentially no net flow of gases under steady state conditions, via an unrestricted downstream extremity opening of said reaction zone while the cracked hydrocarbon



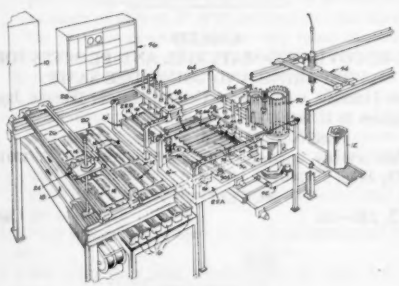
stream containing a residual amount of catalyst particulates is diverted laterally prior to said discharging into a cyclonic separation system communicating with the reaction zone near said downstream opening thereof through an opening upstream of and near said downstream extremity opening.

4,066,534

APPARATUS AND METHOD FOR ASSEMBLING FUEL ELEMENTS

Satya Prakash Arya, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Apr. 7, 1976, Ser. No. 674,680
Int. Cl.² B07C *5/04*
U.S. Cl. 209—82 **23 Claims**



14. A stacking apparatus for receiving arrays of cylindrical parts in side-to-side relation and arranging them in axially aligned stacks of selected lengths and/or numbers of parts, comprising:

a feed trough means for receiving the cylindrical parts in side-to-side arrangement,

the feed trough means including a pair of parallel screw members, the screw members having helical thread means with a thread pitch approximately equal to the diameter of the cylindrical parts, the screw members being rotatable in unison for shifting the cylindrical parts,

a stacking assembly including table means forming a plurality of stacking troughs each extending parallel to the axis of the cylinder parts,

gate means for regulating the passage of individual cylindrical parts from the feed trough means into end-to-end relation upon a selected stacking trough means,

monitoring means associated with the stacking assembly for inspecting the stacks of axially aligned cylindrical parts, and

means for receiving the inspected stacks of cylindrical parts from the respective troughs in the stacking assembly,

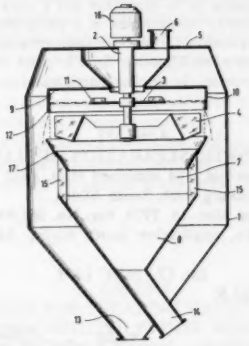
the table means of the stacking assembly being movable for selectively aligning the respective stacking troughs with the gate means and the receiving means.

4,066,535

METHOD AND APPARATUS FOR THE CLASSIFICATION OF FINE MATERIAL FROM A STREAM OF MATERIAL IN A CIRCULATING AIR CLASSIFIER

Werner Strauss, Bochum, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed June 10, 1976, Ser. No. 694,838
Claims priority, application Germany, June 19, 1975, 2527340
Int. Cl.² B07B *4/02*
U.S. Cl. 209—139 A **6 Claims**



1. A classifier for classifying particulate materials comprising:

means defining an outer housing,

means defining an inner housing spaced from said outer housing and concentric therewith,

inlet means for introducing a stream of particles through said outer housing,

a horizontally disposed rotating spreading means receiving said stream and arranged to centrifugally propel the particles outwardly,

baffle means substantially surrounding said spreading means and positioned to be impacted by the particles propelled by said spreading means to form a falling annular dispersion of particles, said baffle being substantially coextensive with the inlet to said housing,

an impeller located below said spreading means and arranged to direct air radially through said dispersion to thereby separate finer particles from coarser particles, and

means for separately collecting said finer particles and said coarser particles.

4,066,536

PARTICLE SIZE SEPARATION BY SUSPENSION FLOW IN AN UNOBSTRUCTED PASSAGEWAY

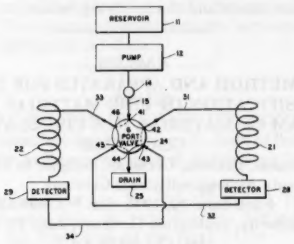
Dean M. Ball; Robert C. Fincher, both of Norcross, and Clyde Orr, Jr., Dunwoody, all of Ga., assignors to Micromeritics Instrument Corporation, Norcross, Ga.

Filed Aug. 9, 1976, Ser. No. 712,838
Int. Cl.² B03B *5/00*
U.S. Cl. 209—155 **18 Claims**

1. In a method of separating particles into isolated particle size fractions, the steps of

dispersing said particles in a liquid dispersing medium to obtain a particle suspension;

passing said particle suspension through an elongate unrestricted tube by a laminar flow of said particle suspension, said laminar flow being undisturbed by said passageway



and external forces and having a cross sectional area in a plane transverse to its direction and a duration sufficient for the majority of particles of a particular size in said particle suspension to become substantially advanced in the direction of said laminar flow beyond the majority of the next successively smaller particles in said suspension.

4,066,537

WET MAGNETIC SEPARATION OF MATERIALS

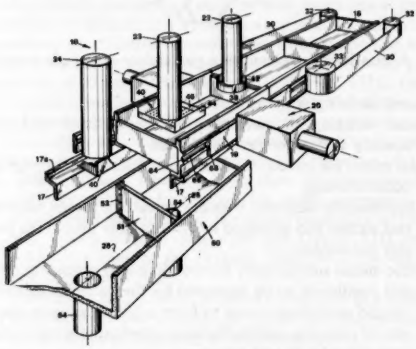
Georg Josef Bernfeld, 114 Stamford Hall, Paul Nel St., Hillbrow, Johannesburg 2001, South Africa

Filed Mar. 15, 1976, Ser. No. 666,936

Claims priority, application South Africa, Mar. 27, 1975, 75/1940

Int. Cl.[2] B03C *1/08*

U.S. Cl. 209—223 R **15 Claims**



1. In a separator of the type including:

magnetic means for establishing zones of high and low magnetic density;

matrix container units comprising a series of separate matrix container units which are movable in a path through said zones of high and low magnetic intensity;

matrix means within each matrix container unit;

feed means supplying slurry to said matrix container means;

washing means for washing out material entrapped in the matrix means;

launder means receiving respectively matter passing through said matrix container means at at least said high magnetic intensity zone and said low magnetic intensity zone; and

moving means operatively connected to said container means for moving said matrix container means through said high and low magnetic intensity zones;

the improvement wherein the moving means comprises a path through said zones established by said magnetic means, means for transferring said container units onto said path, and means for providing a moving force to said units to move the container units as a continuous matrix through the magnetic zones, and wherein the matrix container units are removable and replaceable when in the means for transferring without interrupting the continuous movement of the container units along said path.

4,066,538

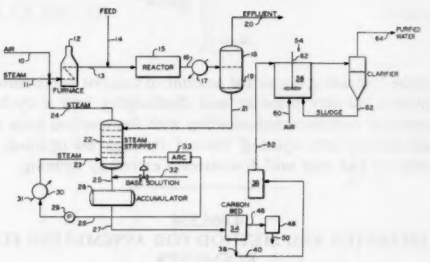
WATER PURIFICATION BY TREATING WITH ACTIVATED CARBON BEFORE BIOCHEMICAL TREATMENT

Martin R. Cines, and Ben B. Buchanan, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 17, 1974, Ser. No. 434,006

Int. Cl.[2] C02C *1/06*

U.S. Cl. 210—15 **11 Claims**



1. A process comprising: contacting waste water having a COD of greater than 1000 milligrams/liter, over 50 percent of the material creating said COD being soluble in said water, with activated carbon; thereafter subjecting said thus treated water to a biochemical treatment to further reduce said COD.

4,066,539

OIL-RECOVERING MATERIAL AND PROCESS FOR PREPARING AND USING THE SAME

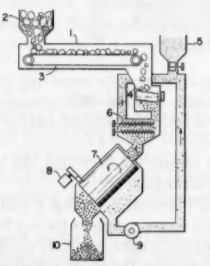
Takeshi Hachisu, and Akinari Uchida, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 23, 1976, Ser. No. 744,401

Claims priority, application Japan, Nov. 25, 1975, 50-140196; Nov. 25, 1975, 50-140197

Int. Cl.[2] C02B *9/02*

U.S. Cl. 210—36 **6 Claims**



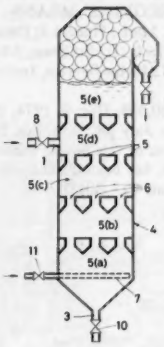
1. An oil-recovering material which comprises atactic polypropylene granules and a cereal powder deposited onto the surface of the granules.

3. A method for the recovery of oil from water-containing oil or sand-containing oil comprising contacting the water-containing oil or sand-containing oil with the product of claim 1, whereby the oil is absorbed by the oil-recovering product.

4,066,540
APPARATUS AND METHOD FOR CONTINUOUS FROTH FLOTATION

Shinji Wada; Yoshiaki Matsunaga, both of Tokyo, and Michihiro Noda, Zushi, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation of Ser. No. 612,494, Sept. 11, 1975, abandoned.
This application Oct. 28, 1976, Ser. No. 736,341
Claims priority, application Japan, Sept. 12, 1974, 49-105156
Int. Cl.[2] B03D *1/02, 1/24*
U.S. Cl. 210—44 6 Claims



1. An apparatus for the continuous flotation and separation of froth by forcing gas bubbles into counter-current contact with a liquid, comprising
   1. a vertically elongate column,
   2. a plurality of shelves vertically spaced in said column and dividing the interior of said column into a plurality of vertically offset zones,
      a. said shelves each defining a plurality of unobstructed passages, each passage consisting of an upper part of fixed width and a lower part contiguous with said upper part, flaring outwardly and defined by faces inclined by an angle of at least 3° with reference to the horizontal, the passages constituting the only interconnection between two of the offset zones adjacent each shelf,
      b. respective ones of said unobstructed passages in the plurality of shelves being vertically aligned to define continuous vertical spaces extending from a head portion to the bottom of the interior of the column, and
      c. the total area occupied by said unobstructed passages in each of said shelves being no less than 3 percent and no more than 30 percent of the total cross-sectional area of the column,
   3. a froth separator disposed in the head portion of the column,
   4. a raw water inlet pipe opening onto an upper one of the zones,
   5. a treated water outlet pipe disposed at the bottom of the column, and
   6. a gas dispersing unit disposed below a lowermost one of said shelves.

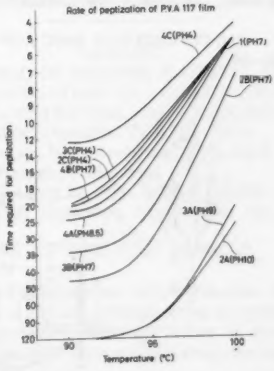
6. A method for the treatment of raw water by use of an apparatus for the continuous flotation and separation of froth comprising
   1. a vertically elongate column,
   2. a plurality of shelves vertically spaced in said column and dividing the interior of said column into a plurality of vertically offset zones,
      a. said shelves each defining a plurality of unobstructed passages, each passage consisting of an upper part of fixed width and a lower part contiguous with said upper part, flaring outwardly and defined by faces inclined by an angle of at least 3° with reference to the horizontal, the passages constituting the only interconnection between two of the offset zones adjacent each shelf,
      b. respective ones of said unobstructed passages in the plurality of shelves being vertically aligned to define continuous vertical spaces extending from a head portion to the bottom of the interior of the column, and
      c. the total area occupied by said unobstructed passages in each of said shelves being no less than 3 percent and no more than 30 percent of the total cross-sectional area of the column,
   3. a froth separator disposed in the head portion of the column,
   4. a raw water inlet pipe opening on an upper one of the zones,
   5. a treated water outlet pipe disposed at the bottom of the column, and
   6. a gas dispersing unit disposed below a lowermost one of said shelves,

which method comprises the steps of continuously introducing the raw water subjected to treatment into said vertically elongate column through the raw water inlet pipe and continuously feeding air under pressure into said column through the gas dispersing unit, whereby the raw water continuously descending through the unobstructed passages in the successively lower shelves and the air continuously ascending in the form of bubbles through the unobstructed passages in the successively higher shelves come into countercurrent contact with each other so that substances contained in the raw water are now deposited on or adsorbed on said bubbles, and the bubbles on which the substancees formerly contained in the raw water are now deposited or adsorbed are discharged to the froth separator and the water which has been stripped of said substances is discharged through the treated water outlet pipe.

4,066,541
PROCESS FOR TREATING WASTE WATER CONTAINING POLYVINYL ALCOHOL

Yoshikazu Sando; Hiroshi Ishidoshiro, and Eiichi Nakano, all of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Japan

Filed May 19, 1976, Ser. No. 688,069
Claims priority, application Japan, May 28, 1975, 50-63837
Int. Cl.[2] B01D *5/00, 11/00, 17/00*
U.S. Cl. 210—51 12 Claims



1. A process for treating waste water containing polyvinyl alcohol comprising reacting the polyvinyl alcohol in the waste water at a pH from 8 to 10 with a boron compound selected from the group consisting of boric acid and borax in the presence of an inorganic salt to produce a complex of the boron compound and the polyvinyl alcohol, and separating the complex therefrom.

4,066,542
METHOD OF PURIFICATION OF WASTE WATER BY TREATMENT WITH ZIRCONIUM SALT

Buichiro Ayukawa, Musahino, Japan, assignor to Shikoku Paper Mfg. Co., Ltd., Japan

Division of Ser. No. 519,866, Nov. 1, 1974, Pat. No. 3,997,439. This application Aug. 9, 1976, Ser. No. 712,926
Claims priority, application Japan, Nov. 7, 1973, 48-125118
The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.
Int. Cl.[2] C02C *5/04*; C02B *1/20*
U.S. Cl. 210—51 **2 Claims**

1. A process for the purification of surface water which comprises adding an aqueous solution of $ZrOCl_2.8H_2O$ to said surface water and adjusting the pH to 4.5–6.8 to coagulate and precipitate suspended substances and colloidal dispersed particles and precipitate non-colloidal dissolved, low molecular weight organic substances therein in the form of insoluble precipitates and chelates, and removing said precipitates and chelates.

4,066,543
CONTINUOUS PROCESS FOR NON-CATALYTIC OXIDATION OF SULFITE-CONTAINING WATERS

Drew E. McCoy, Nederland, Tex., assignor to Texaco Inc., New York, N.Y.

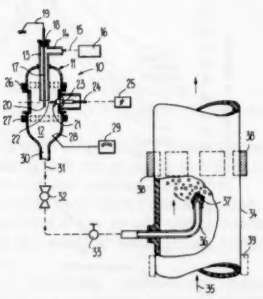
Filed Nov. 12, 1975, Ser. No. 631,257
Int. Cl.[2] C02C *5/04*
U.S. Cl. 210—63 R **10 Claims**

1. In a continuous process for the liquid phase oxidation of water containing substantially only sulfite and/or bisulfite ions, the steps of: heating said water to a temperature of about 150° to 250° F; oxidizing the heated water under a pressure of around 25 to 50 psig at a liquid hourly space velocity of between 0.5 and 12.0 volumes of feed per reactor void volume with a non-catalytic, oxidizing medium containing from 100 to 350 percent excess oxygen basis stoichiometric conversion of sulfite and bisulfite ions to sulfate ions and recovering an effluent containing substantially no other anions than sulfate.

4,066,544
METHOD AND APPARATUS FOR ELECTRO SHOCK DEGERMINATION OF WATER

Walter Stark, Magliaso, Switzerland, assignor to Multorgan S.A., Magliaso, Switzerland

Filed Sept. 3, 1976, Ser. No. 720,195
Claims priority, application Switzerland, Sept. 8, 1975, 11643/75
Int. Cl.[2] C02B *3/06*; B03C *1/30*
U.S. Cl. 210—64 **14 Claims**



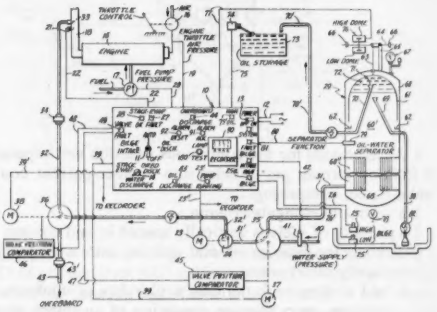
1. A method of degerminating water, comprising the steps of:
   a. furnishing a supply of flowing water containing bacteria which are to be killed;
   b. subjecting the flowing water to a magnetic field;
   c. positioning the magnetic field contacting the flowing water for increasing the concentration of bacteria at a predetermined location in the flowing water;
   d. introducing an air-air ion mixture having at least $5 \cdot 10^6$ air ions per cm^3 into the water at the location where the bacteria are concentrated,

   whereby the bacteria kill rate is increased by electro-shock action.

4,066,545
BILGE WATER DISPOSAL SYSTEM INCLUDING OIL RECOVERY MEANS

Chester H. Walters, St. Louis; Harold J. Barmeier, Jr., Ballwin, both of Mo., and Greig E. Sullivan, Marshalltown, Iowa, assignors to National Marine Service, Incorporated, St. Louis, Mo.

Division of Ser. No. 530,539, Dec. 9, 1974, Pat. No. 4,018,683. This application July 28, 1976, Ser. No. 709,456
The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.
Int. Cl.[2] B01D *1/14*
U.S. Cl. 210—71 **7 Claims**



1. The method of disposing of water by injecting and vaporization of same in the exhaust duct of an internal combustion engine comprising:
   a. operating the internal combustion engine to cause flow of hot exhaust gases in the exhaust duct of the engine;
   b. sensing sequentially via a control system whether the engine is operating or not; the power level setting of the engine; and the temperature of engine exhaust gas in the vicinity of the duct where the water is injected;
   c. under regulation of the control system, injecting water into the duct only after sequentially sensing that the engine is operating; that the power level setting is at a predetermined setting; and the exhaust gases flowing through the duct in the vicinity of where the water is injected is at a desired minimum flash vaporization temperature; and preventing flow of water to the duct if the foregoing recited sequence of events and conditions is not sensed, and if any one or more of the events or conditions ceases to be sensed after flow of water to the duct has begun.

2. In a flash vaporization water disposal system wherein vaporization is carried out by directly injecting processed water into the exhaust gas duct of an internal combustion engine, and including a means for controllably supplying a flow of water to the exhaust gas duct, an improved water flow control system comprising means for sensing whether the engine is operation or not; means for sensing the power level setting of the engines; and means for sensing the exhaust gas temperature in the exhaust duct; and further including means for disabling flow of water to the exhaust duct unless and until at least engine operation and a predetermined exhaust gas temperature are sequentially sensed in the recited order by the respective sensing means, whereby a premature and false sensing of the predetermined exhaust gas temperature before a sensing of actual engine operation will be indicative of a mal-

function in the sensing system, and such disablement will prevent inadvertent supply of water to the exhaust duct under improper operating conditions.

4,066,546

CONTINUOUS FILTERING PROCESS AND AN APPARATUS THEREFOR

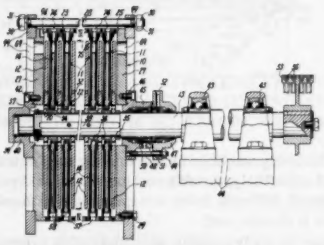
Jiro Sasaki, Nara, Japan, assignor to Toshin Science Co., Ltd. and Sekisui Kagaku Kogyo Kabushiki Kaisha, both of Osaka, Japan, part interest to each

Filed Oct. 8, 1975, Ser. No. 620,648

Claims priority, application Japan, Oct. 25, 1974, 49-123840; May 28, 1975, 50-64712

Int. Cl.[2] B01D *37/02*

U.S. Cl. 210—75 **3 Claims**



1. A continuous filtering process comprising the steps of:
a. admixing fluid to be filtered with a predetermined amount of solid particles which can remove free impurities in the fluid by adsorption, absorption, promotion of a decomposition reaction or the like when the particles become in contact with such free impurities;
b. permitting said solid particles to remove free impurities in the fluid by adsorption, absorption, promotion of decomposition or the like,
c. continuously flowing the fluid to be filtered having been admixed with said solid particles through an inlet of a filter tank having therein
i. a plurality of hollow filter disks fixedly arranged with equal intervals therebetween,
ii. facing filter media supported on the filter disks, and
iii. a plurality of rotators, each rotator being positioned between two adjacent filter disks with small clearances between the surfaces of the rotator and the surfaces of the filter media on the filter disks,
d. rotating the rotators continuously with a predetermined speed of rotation to cause a violent turbulence of the fluid to be filtered and thereby causing motion of the solid particles on the surfaces of the filter media, removing a layer of concentrated fluid from the surfaces of the filter media by said violent turbulence of the fluid and by motion of the solid particles, and achieving filtration through the filter media without substantial impurities adhering on the surfaces of the filter media;
e. continuously withdrawing filtrate from within the hollow filter disks;
f. continuously withdrawing fluid to be filtered from an outlet of the filter tank to an inlet end of an agitation tank having agitation means therein and agitating the fluid within the agitation tank,
g. supplying fresh fluid to be filtered to said inlet end of the agitation tank at a rate substantially equal to the rate of withdrawing said filtrate from the filter disks;
h. agitating the fluid in the agitation tank;
i. continuously withdrawing fluid from an outlet end of the agitation tank, the outlet end of the agitation tank being spaced from the inlet end to provide the fluid within the agitation tank with a stay time and agitation by means of the agitation means whereby the concentration of free impurities in the said fluid is lowered to a concentration that is substantially equal to the concentration of free impurities in the fresh fluid to be filtered; and
j. continuously supplying the fluid withdrawn from the outlet end of the agitation tank to the inlet of the filter tank.

2. A continuous filtering apparatus comprising:
a. a filter tank including a plurality of hollow filter disks fixedly arranged in the tank with equal intervals therebetween and with facing filter media supported on the filter disks, a plurality of rotators positioned between two adjacent filter disks with small clearances between the surfaces of the rotators and the surfaces of the filter media, fluid inlet means and fluid outlet means on the filter tank, and filtrate withdrawing means communicating with the hollow filter disks, said rotators causing a violent turbulency of the fluid to be filtered on the surfaces of the filter media when the rotators are rotated with a predetermined speed of rotation;
b. an agitation tank including therein agitation means for agitating fluid, first inlet means at one end of the agitation tank for concentrated fluid to be filtered, second inlet means for fresh fluid to be filtered, and outlet means at another end of the agitation tank for fluid to be filtered;
c. a first circulation path means connecting said fluid outlet means of said filter tank to said first inlet means of said agitation tank;
d. a fluid supply path means connected to said second inlet means of said agitation tank and including therein pump means for continuously supplying fresh fluid to be filtered to said agitation tank at a predetermined rate;
e. a second circulation path means connecting said outlet means of said agitation tank to said fluid inlet means of said filter tank and including therein pump means for continuously pumping fluid to be filtered from said agitation tank to said filter tank;
f. solid particle supply means connected to the circulation line formed by said filter tank, said first circulation path means, said agitation tank, and second circulation path means for supplying to said circulation line a predetermined amount of solid particles which can remove free impurities in the fluid to be filtered by adsorption, absorption, promotion of a decomposition reaction or the like; and
g. driving means operatively connected to said rotators in the filter tank for continuously rotating the rotators with said predetermined speed of rotation.

4,066,547

METHOD OF FEEDING MATERIAL FOR CENTRIFUGATION TO A CONTINUOUSLY OPERATING CENTRIFUGE, AND A CENTRIFUGE FOR PERFORMING THE METHOD

Dirk Hoks, Hengelo, Netherlands, assignor to Stork-Werkspoor Sugar B.V., Hengelo, Netherlands

Filed July 22, 1976, Ser. No. 707,650

Claims priority, application Netherlands, Aug. 15, 1975, 7509783

Int. Cl.[2] B01D *33/02;* **B04B** *3/00*

U.S. Cl. 210—78 **7 Claims**

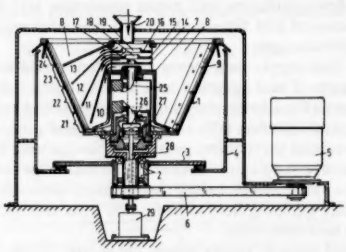
1. In a centrifuging method which comprises the steps of axially rotating a conical, perforate drum at a predetermined speed, and continuously feeding a stream of material to be centrifuged to the inner surface of said drum, the improvement which comprises:
distributing said feeding by plural distribution means which are vertically displaced one from the other; each of said distribution means comprising guide blade means and flow proportionating means; any one of said flow proportionating means functioning to provide a greater flow therethrough than any other of said flow proportionating means therebelow, such that consecutive annular sections

of said inner surface of the drum, successively from the smaller end to the larger end of the drum, receive increasingly greater quantities of said stream of material, said quantities being related such that any two quantities are in the same ratio as the squares of the average diameters of their respective annular sections.

3. A continuously operating centrifuge comprising, in combination:

a frusto-conical, perforate drum and means for rapidly rotating said drum about its logitudinal axis; and

plural means for distributing a stream of material to be centrifuged into the interior of said drum, each of said means being vertically displaced one from the other, and each of said means for distributing comprising guide blade means and flow proportionating means; any one of said flow proportionating means functioning to provide a greater flow therethrough than any other of said flow proportionating means therebelow, so as to divide said stream into a plurality of sub-flows and directing each sub-flow to a respective annular section of the drum, said sub-flows being related in quantities such that the quantities of any two sub-flows are in the same ratio as the squares of the average diameters of their respective annular sections.



7. A continuously operating centrifuge comprising, in combination:

a frusto-conical drum having a perforate wall;

drive means for rotating said drum about its longitudinal axis whereby material to be centrifuged which is discharged against any particular inner surface annular section of said wall is subjected to centrifugal force having a value unique to that annular section;

plural means for distributing a stream of material to be centrifuged into a plurality of sub-flows directed to successive inner surface annular sections of said wall such that progressively thicker layers of material build up on the inner surface of said wall from the smaller to the larger end of said drum, each of said means for distributing being vertically displaced one from the other and comprising guide blade means and flow proportionating means; and one of said flow proportionating means functioning to provide a greater flow therethrough than any other of said flow proportionating means therebelow, such that the material in all of said layers tends to be homogeneous; and

means for continuously removing said layers to recover the homogeneous material.

4,066,548
SLUDGE HYDROEXTRACTOR

Larry Lee Olson, and Richard Henry Jones, both of Gainesville, Fla., assignors to Richard Henry Jones and Pasquale A. Corrado, Gainesville, Fla.

Filed Aug. 11, 1976, Ser. No. 713,488
Int. Cl.[2] B01D *33/14*
U.S. Cl. 210—160 **10 Claims**

1. An apparatus for the continuous hydroextraction of water containing sludge material comprising:

a. a lower support frame;

b. a plurality of extraction rollers on said lower support frame having a feed end and an exit end;

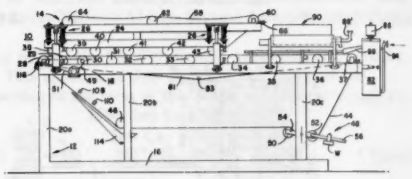
c. a pervious extraction belt driven over said extraction rollers;

d. an upper frame supported above said lower frame;

e. a plurality of pressure rollers on said upper frame having a feed end and an exit end corresponding to the feed end and exit end of said extraction rollers;

f. an impervious pressure belt driven over said pressure rollers, said pressure belt contacting said extraction belt to squeeze sludge material passing therebetween;

g. means adjustably supporting said upper frame above said lower frame;



h. selectively variable means driving said extraction rollers and selectively variable means driving said pressure belt at a speed different from the speed at which said extraction belt is driven; and

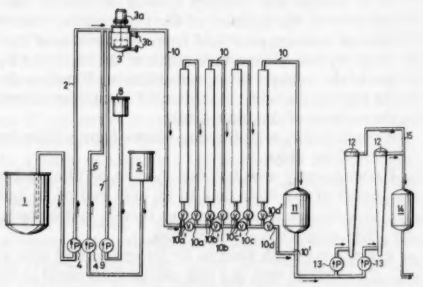
i. means to apply continuously increasing pressure contact to said extraction belt and said pressure belt from where the sludge material enters between said belts to where the sludge material extis;

wherein said means to apply continuously increasing pressure contact includes a predetermined, diminishing, progressive spacing of said extraction rollers and said pressure rollers, and an offset alignment of said pressure rollers between said extraction rollers, said means g., h., and i., cooperatively functioning to provide a sludge cake of substantially uniform thickness.

4,066,549
APPARATUS FOR THE PRECIPITATION OF HUMAN BLOOD PLASMA COMPONENTS

Henning Oeser, Duisburg, and Ulrich Ahrens, Springe, both of Germany, assignors to Blutspendedienst der Landesverbande des Deutschen Roten Kreuzes Niedersachsen, Oldenburg und Bremen GmbH, Germany

Filed Sept. 18, 1975, Ser. No. 614,419
Claims priority, application Germany, Sept. 18, 1974, 2444524
Int. Cl.[2] C07G *7/00*; B03D *3/02*; A23J *1/06*
U.S. Cl. 210—177 **4 Claims**



1. An apparatus for the continuous precipitation of human blood plasma components comprising:

individual supply containers for blood plasma, a precipitation agent and a buffer solution,

a precipitation vessel,

means for conveying the blood plasma and the precipitation

agent from the respective supply containers to said precipitation vessel and including means for combining the blood plasma and precipitating agent immediately upstream of said precipitation vessel,

means for conveying the buffer solution from its respective supply container to said precipitation vessel,

means for cooling said precipitation vessel and the contents thereof,

means for causing turbulence in said precipitation vessel,

a flow passageway connecting said precipitation vessel and centrifuge means, said flow passageway being so constructed as to permit substantially laminar flow of fluid therethrough,

means for selectively changing the residence time of fluid in said flow passageway by varying the length of said flow passageway through which fluid is caused to flow, and

means for removing the centrifugate from said centrifuge means.

4,066,550

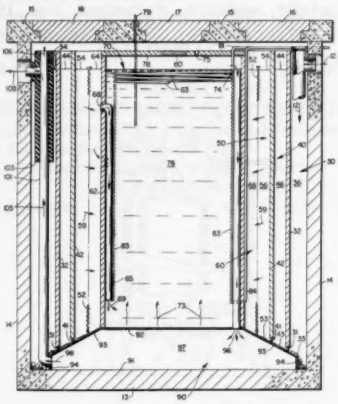
APPARATUS FOR SEWAGE TREATMENT WITH COUNTERCURRENT HEAT TRANSFER MEANS

Stanley Beaumont, 118 Macorna St., Watsonia, Australia (VIC 3087)

Continuation-in-part of Ser. No. 603,623, Aug. 11, 1975, abandoned, which is a continuation of Ser. No. 435,647, Jan. 23, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 667,171

Int. Cl.[2] C02C *1/16*

U.S. Cl. 210—183 **20 Claims**



1. An anerobic apparatus for digesting sewage at elevated temperatures within fluid bodies by acid-producing bacteria and by methanobacteria, whereby sludge, supernatant and slime are isolated, comprising:

A. three narrow and deep circular flow chambers:

1. which are defined by an outer cylinder, two intermediate cylinders, and an inner cylinder,

2. through which said sewage flows circumannularly to deposit said sludge and and form said supernatant, and

3. which are interconnected by:

a. fluid transfer means for radially and inwardly displacing said supernatant by sewage entering said apparatus, each said fluid transfer means being disposed alternately approximately 180° apart in said intermediate cylinders and at mid-depth in said flow chambers, and

b. solids transfer means, for outwardly, radially, and counter-currently moving said sludge and said slime by gravity, each said solids tranfer means being disposed along the bottoms of said intermediate cylinders;

B. a filter means for entrapping suspended particles within said supernatant, for enabling thermophilic bacteria to digest the entrapped particles, and for permitting clear fluid to pass therethrough, said filter means being disposed in the flow chamber between said inner cylinder and one of said intermediate cylinders;

C. a sterlizing means for heating said clear fluid to temperatures above 75° C, to change said clear fluid to sterilized fluid, including a heating means for adding heat to said apparatus, which is disposed within said inner cylinder; and

D. a heat exchange means for contercurrently transferring heat from said sterilized fluid to said clear fluid in said sterilizing means and to said sewage and said supernatant in said three flow chambers.

4,066,551

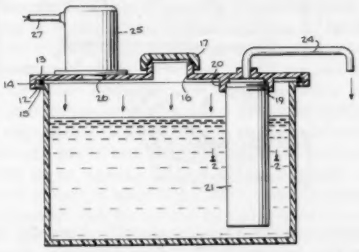
PORTABLE WATER FILTRATION DEVICE

Emanuel Stern, Mount Kisco, N.Y., assignor to Dynek Corporation, Port Chester, N.Y.

Filed Jan. 7, 1976, Ser. No. 647,319

Int. Cl.[2] B01D *27/02*

U.S. Cl. 210—282 **4 Claims**



1. A portable water filtration device comprising

a housing defining a reservoir chamber for water and having a capacity of one to five quarts;

a cover secured to said housing;

a seal between said cover and said housing;

an inlet in said cover for introduction of water into said chamber;

a cap for selectively sealing said inlet;

a filter threadably secured to said cover and depending into said chamber, said filter including at least one filter medium, and a submicron membrane encasing said filter medium, said membrane being impermeable to the passage of water under normal pressure but which is rendered permeable under pressurized conditions;

a spout extending through said cover into communication with said filter to deliver treated water therefrom; and

an air pump mounted on said cover to pump air into said chamber to force water in said reservoir chamber upwardly through said filter and into said spout for dispensing therefrom.

4,066,552

COMBINED PUMP AND SELF-CLEANING CENTRIFUGAL CONTAMINATION SEPARATOR

Gerard H. Caine, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Continuation of Ser. No. 505,984, Sept. 13, 1974, abandoned, which is a continuation of Ser. No. 168,933, Aug. 4, 1971, abandoned. This application July 7, 1975, Ser. No. 593,529

Int. Cl.[2] B01D *21/02, 23/26, 33/38, 43/04*

U.S. Cl. 210—304 **7 Claims**

1. A combined pump and self-cleaning centrifugal contamination separator for a fluid subject to contamination by the

presence therein of undesirable suspended solid particles, comprising:

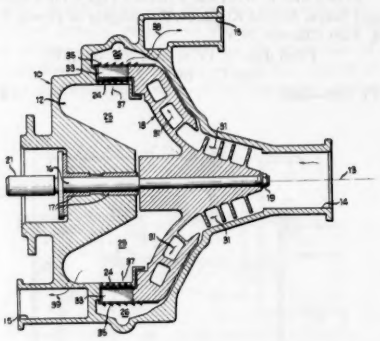
a housing having a longitudinal axis and enclosing a cavity which is generally symmetrical about said axis;

an inlet in said housing communicating with said cavity, said inlet receiving said fluid;

means, including a stationary cylindrical particle barrier screen fixed in said housing and coaxial with said cavity, dividing said cavity into an inner chamber radially inward of said barrier screen and an outer generally annular chamber radially outward of and encircling said screen, said barrier screen having apertures therethrough and a smooth external surface;

a first discharge outlet in said housing communicating with said inner chamber;

a second discharge outlet in said housing communicating with said outer chamber; and



means, including a rotating centrifugal impeller within said cavity, for pumping fluid from the inlet to the outlets, the impeller having thereon a plurality of vanes revolving in said outer chamber for spinning the contaminated fluid around the outer chamber, washing the external surface of the screen to prevent solid contaminants from collecting thereon and adhering thereto, the fluid spinning in the outer chamber turning 90° to pass inward through said barrier screen to said first discharge outlet, contaminant particles being prevented by inertia from turning to pass through the screen with the fluid, whereby contaminant particles substantially smaller than the screen apertures are separated from the fluid and the contaminants are centrifuged radially outward to facilitate separation and removal through said second discharge outlet.

4,066,553

APPARATUS WITH SUPPORTED TUBULAR MEMBRANES FOR THE TREATMENT OF FLUIDS

Claude Bardonnet, Lyon; Robert Brun, Bollene, and Michel Pages, D'Ardeche, all of France, assignors to Rhone-Poulenc Industries, Paris, France

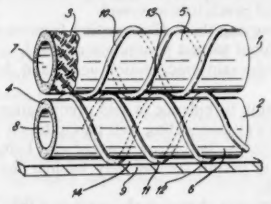
Filed Oct. 14, 1975, Ser. No. 622,443

Claims priority, application France, Oct. 15, 1974, 74.34611

Int. Cl.[2] B01D *13/00;* **C02B** *1/74, 1/82*

U.S. Cl. 210—321 R **8 Claims**

1. In an apparatus for the treatment of fluids which consists essentially of a plurality of flexible tubular porous supports on the outer surface of which is a semi-permeable membrane the improvement wherein membranes on adjacent supports are kept out of contact with each other solely by separation means



consisting essentially of one or more thread-like elements wound spirally around and on the membrane.

4,066,554

FILTRATION APPARATUS

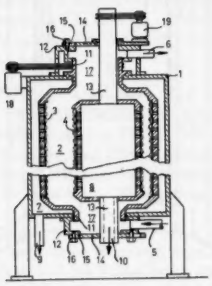
August Guyer, Zurich, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Nov. 30, 1976, Ser. No. 746,105

Claims priority, application Switzerland, Dec. 11, 1975, 016074/75

Int. Cl.[2] B01D *33/06*

U.S. Cl. 210—342 **6 Claims**



1. Apparatus for filtering a suspension under pressure comprising

a. a housing containing an elongated annular filtration chamber bounded by external and internal surfaces in the form of bodies of revolution,

b. at least one of said surfaces being mounted for rotation about its axis, and at least one of said surfaces being formed as a filtering member and being provided with a filtrate discharge collector,

c. said surfaces being arranged eccentrically relative to each other so that the cross section of said annular chamber varies and has a minimum width sufficient to allow passage of the material being filtered; and

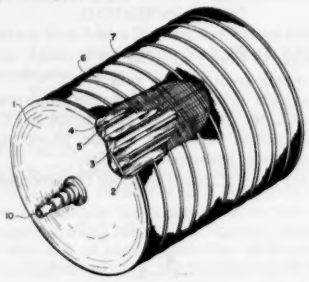
d. an inlet for introducing suspension under pressure to one end of said annular chamber and an axially spaced outlet for discharging filtered material from the opposite end of that chamber,

e. whereby the material being filtered is subjected to cyclically varying shearing forces as it passes through the annular chamber and caking of the filtering member is avoided.

4,066,555
ROTARY FILTER

Joseph Andrew Pascale, 41 Longmeadow, Pine Bluff, Ark. 71603

Filed May 6, 1976, Ser. No. 684,068
Int. Cl.[2] B01D *33/06*
U.S. Cl. 210—402 12 Claims



1. In a rotary filter, the combination of:
a. An inner cylindrical surface;
b. A plurality of support structures selectively spaced apart and extending longitudinally along said surface;
c. Plastic coverings fitted over said support structures;
d. A filter medium extending around the outer circumference formed by said support structures and resting against said support structures; and,
e. Means for holding said filter medium firmly against said support structures.

4,066,556
FLUID FILTER AND METHOD OF MAKING SAME

Vincent Louis Vaillancourt, Livingston, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

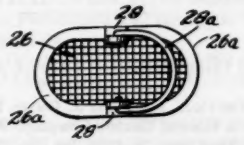
Filed Oct. 28, 1976, Ser. No. 736,670
Int. Cl.[2] C02C *1/14*
U.S. Cl. 210—448 10 Claims

1. A filter assembly of a conventional size convenient for positioning on the arm of a patient, and for use in the filtering of intravenous fluids, comprising: a housing; a flexible filter pouch in said housing formed from porous membrane filter media having a pore size not greater than 0.22 microns, said pouch having a fluid opening in one end thereof; fluid inlet means extending into said housing in fluid communication with the interior of said filter pouch through said fluid opening; and fluid outlet means extending from said housing in fluid communication with the interior of said housing external of said filter pouch; whereby fluid may pass through said fluid inlet means into the interior of said filter pouch, pass through the membrane filter media of said filter pouch into the interior of said housing external of said filter pouch and then exit from said housing through said fluid outlet means, said filter pouch providing a sufficiently low pressure drop thereacross, so as to eliminate the requirement of a fluid pump to force said fluid through said assembly.

4,066,557
PAINT STRAINER

Joseph A. Banoczi, 82 West Ave., Darien, Conn. 06820

Filed Sept. 14, 1972, Ser. No. 288,894
Int. Cl.[2] B01D *35/28*
U.S. Cl. 210—470 2 Claims



1. A paint can fitment for separating lumps of coagulated paint from free flowing paint comprising a screen strainer, said screen having an arcuate circumference, a means for reinforcing the arcuate circumference of said screen and comprising an arcuate reinforcing section, said section being a separate member; and a pair of ears mounted in substantially opposite disposition upon said section, each of said ears having an opening in substantial alignment with the opening in the opposite ear, and a handle having a pair of bent extensions, with each said extension inserted in an opening in one of the aforesaid ears, whereby said strainer is adapted for sliding and substantially sealing engagement with the interior curved wall of a conventional paint can and for permitting said strainer to be pressed down through paint in said can to filter said paint by holding lumps of coagulated paint beneath said strainer, thereby permitting utilization of the filtered paint above said strainer.

4,066,558
LOW VISCOSITY SPIN FINISH SYSTEMS FOR NEAT FINISH APPLICATION

Barry M. Shay, and Remo Santacecilia, both of Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.

Filed Feb. 11, 1974, Ser. No. 441,265
Int. Cl.[2] D06M *13/16, 13/18, 13/20*
U.S. Cl. 252—8.9 5 Claims

1. A clear, stable yarn lubricating composition having a viscosity in the range of 35–65 centipoises as determined on a Brookfield Viscometer Model LVT using Spindle 1 at 60 R.P.M. at 75° F. which consists essentially of:
a. 40–60 percent by weight of a hydrophobic lubricant having a viscosity in the range of 20–60 centipoises selected from stearates of monohydric alkyl alcohols having from 4–16 carbon atoms,
b. 20–55 percent by weight of a hydrophilic lubricant having a viscosity in the range of 35–110 **l centipoises selected from the group consisting of polyoxyethylene**(2–10-)monohydric fatty alcohols having 10–20 carbon atoms, polyoxyethylene(5–20) nonyl phenols, and polyoxyethylene(5–20)tridecyl alcohols,
c. 5–15 percent by weight of an antistat having a viscosity in the range of 25–110 centipoises selected from polyoxyethylene(8)lauric acid, polyoxyethylene(20)tallow amine, and polyoxyethylene(23)fatty acid esters of glycerine wherein said fatty acids have 8–18 carbon atoms, and
d. 0.1% to 5 percent by weight of a polar coupling agent selected from the group consisting of water, ethanol, or a low molecular weight glycol ether.

4,066,559
CONTAINER FOR OIL-ADDITIVE RELEASE

Raymond Rohde, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 73,789, Sept. 21, 1970, Pat. No. 3,749,247. This application May 17, 1973, Ser. No. 361,372
Int. Cl.[2] C10M *1/48*
U.S. Cl. 252—10 **12 Claims**

1. A method for protecting an oil by adding an additive thereto which comprises (1) enclosing the additive within a closed container said container made of a polymer that is permeable to said additive when said container is immersed in said oil at the operating temperature of the oil and (2) placing said container into said oil to be protected.

4,066,560
SILICONE COMPOSITIONS USEFUL AS GREEN TIRE LUBRICANTS

Gordon T. VanVleck, and Frank J. Traver, both of Troy, N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Sept. 20, 1976, Ser. No. 724,447
Int. Cl.[2] C10M *3/18, 5/14, 7/20, 7/24*
U.S. Cl. 252—21 **21 Claims**

1. A process for producing a silicone composition useful as a green tire lubricant with improved lubricity properties comprising:

a. mixing 20 to 55 parts by weight of a mica filler with 2 to 20 parts by weight of a linear diorganopolysiloxane of a viscosity varying from 500 to 200,000 centipoise at 25° C where the organo group is selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals to form a homogeneous mixture;

b. adding to said mixture 2 to 20 parts by weight of an alkylene oxide polyol, 0.05 to 10 parts by weight of a mineral clay and 0.05 to 10 parts by weight of a first emulsifying agent selected from the class consisting of anionic, cationic and non-ionic emulsifying agents and forming a second mixture and

c. adding to said second mixture sufficient water to form an emulsion after the second mixture is thoroughly mixed with said added water.

11. A process for controlling the viscosity of a silicone composition useful as a green tire lubricant comprising,

a. mixing from 20 to 55 parts by weight of a mica filler with 2 to 20 parts by weight of linear diorganopolysiloxane having a viscosity varying from 500 to 200,000 centipoise at 25° C where the organo group is selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals and with 2 to 20 parts by weight of an alkylene oxide polyol, 0.05 to 10 parts by weight of a mineral clay, 0.05 to 10 parts by weight of an emulsifying agent selected from the class consisting of anionic, cationic and non-ionic emulsifying agents and 10 to 60 parts of water to form an emulsion, and

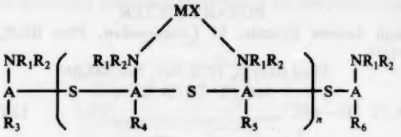
b. adding an effective amount of a buffering agent to the emulsion so as to reduce the viscosity to the desired level.

4,066,561
ORGANOMETALLIC COMPOUNDS AND COMPOSITIONS THEREOF WITH LUBRICANTS

John C. Nnadi, Glassboro, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 430,869, Jan. 4, 1974, abandoned. This application Mar. 13, 1975, Ser. No. 558,022
Int. Cl.[2] C10M *1/40*
U.S. Cl. 252—33.4 **11 Claims**

1. A lubricant composition comprising a major portion of an oil of lubricating viscosity or grease thereof and an oxidation property improving amount of the compound having the following formula:



wherein

n is an integer of from 1 to about 10;

A is an aromatic hydrocarbon moiety;

M is a polyvalent metal selected from the group consisting of Be, Mg, Ca, Ba, Mn, Co, Ni, Pd, Cu, Zn and Cd;

X is oleate, phenyl phosphate, acetate, phosphate, sulfate, sulfonate, oxide, hydroxide or sulfite;

R_1 and R_2 are alkyl of from 1 to about 10 carbon atoms, aryl,

or combinations thereof;

R′ is alkyl of from 1 to about 10 carbon atoms, aryl or hydrogen;

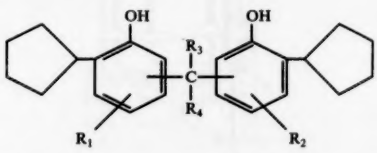
R_3, R_4, R_5 and R_6 are hydrogen, alkyl of from 1 to about 200 carbon atoms, aryl, alkyl-substituted aryl where the alkyl substituent is comprised of from 1 to about 200 carbon atoms or combinations thereof.

4,066,562
ANTIOXIDANT

John C. Wollensak, Bloomfield Hills; Kryn G. Ihrman, Farmington, both of Mich., and Paul G. Elsey, Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Sept. 10, 1976, Ser. No. 722,324
Int. Cl.[2] C07C *39/16;* C01M *1/54*
U.S. Cl. 252—52 R **16 Claims**

1. An antioxidant compound or mixture of compounds having the formula



wherein R_1 and R_2 are cyclopentyl groups and are bonded to their respective phenolic benzene rings at a location independently selected from the ortho and para positions, the methylene bridge being connected between the remaining ortho and para positions, and R_3 and R_4 are independently selected from the group consisting of hydrogen and C_{1-4} alkyl.

6. Organic material normally subject to gradual oxidative deterioration in the presence of air containing an antioxidant amount of a compound of claim 1.

4,066,563
COPPER-TETRA-4-(OCTADECYLSULFONOMIDO) PHTHALOCYANINE ELECTROPHOTOGRAPHIC CARRIER

Joseph Mammino, Penfield, and Franklin Jossel, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 29, 1975, Ser. No. 617,772
Int. Cl.[2] G03G *13/08*
U.S. Cl. 252—62.1 P **5 Claims**

1. A carrier for electrophotographic development comprising a core particle surrounded by an outer layer comprising

resin and copper tetra-4-(octadecylsulfonomido) phthalocyanine.

4,066,564

PROCESS FOR PRODUCING COBALT- AND IRON-CONTAINING FERROMAGNETIC POWDER BY HEAT-TREATMENT IN THE PRESENCE OF AN OXIDIZING AGENT

Koji Sasazawa; Shin-Ichiro Dezawa, and Tatsuji Kitamoto, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed July 2, 1976, Ser. No. 702,171

Claims priority, application Japan, July 2, 1975, 50-82077

Int. Cl.² C01G *49/06, 49/08*

U.S. Cl. 252—62.56 **21 Claims**

1. A process for producing a Co- and Fe-containing ferromagnetic iron oxide powder which comprises adding to a suspension of an acicular ferromagnetic iron oxide an oxidizing agent, an aqueous alkali solution, an aqueous solution containing Co^{+2} ions and an aqueous solution of Fe ions and heat treating the resultant mixture, at a temperature of at least about 80° C

said CO^{+2} ions being present in said aqueous solution containing Co^{+2} ions in an amount of 0.5 to 10 atomic percent based on the amount of iron present in the acicular ferromagnetic iron oxide, said Fe ions being added to the suspension in an amount of at least 0.1 equivalent but not more than 1 equivalent based on the Co^{+2} ions, said aqueous alkali solution containing an amount of alkali such that after neutralizing the Co^{+2} ions and the Fe ions, the hydroxyl ion concentration is at least 0.5 mol/liter; and the amount of oxidizing agent, when it is a gas, is at least 0.1 liter/min per liter of the suspension and when it is a liquid or solid, the amount is at least 0.1 equivalent based on the Co^{+2} ions.

4,066,565

PROCESS FOR PRODUCING COBALT- AND IRON-CONTAINING FERROMAGNETIC POWDER

Koji Sasazawa; Shin-Ichiro Dezawa, and Tatsuji Kitamoto, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed July 2, 1976, Ser. No. 702,172

Claims priority, application Japan, July 2, 1975, 50-82076

Int. Cl.² C01G *49/06, 49/08*

U.S. Cl. 252—62.56 **15 Claims**

1. A process for producing a Co- and Fe- containing ferromagnetic iron oxide powder which comprises adding an aqueous alkali solution, an aqueous solution containing Co^{+2} ions and an aqueous solution of Fe^{+3} ions to a suspension of an acicular ferromagnetic iron oxide and heat-treating the resulting suspension, at a temperature of at least about 80° C;

said Co^{+2} ions being present in said aqueous solution containing Co^{+2} ions in an amount of 0.5 to about 10 atomic percent based on the iron present in the ferromagnetic iron oxide, said Fe^{+3} ions being added to the suspension in an amount of at least 0.1 equivalent but not more than 1 equivalent based on the Co^{+2} ions, and said alkali solution contains alkali in such an amount that after neutralization of the Co^{+2} and Fe^{+3} ions the hydroxyl ion concentration of the suspension is at least about 0.5 mol/liter.

4,066,566

DENTURE CLEANER

Frederick L. Lauster, Massillon, Ohio, assignor to Lafant Research Company, Canton, Ohio

Filed Mar. 31, 1976, Ser. No. 672,390

Int. Cl.² C11D *7/36*

U.S. Cl. 252—136 **2 Claims**

1. A method of removing tarter and stain from a denture with a cleaner, in parts by weight, consisting of from 20 to 24% of water, from 3.6 to 4.4% of dibasic sodium phosphate, from 22 to 26.80% of 85% strength phosphoric acid, from 0.9 to 1.1% of glycerin, from 0.45 to 0.55% of stannic oxide, from 0.03 to 0.07% of n-alkyl (50% C_{14}, 40% C_{12}, 10% C_{16}) dimethyl benzyl ammonium chloride, and from 42.3 to 51.7% of condensate of ethylene oxide with hydrophobic base formed by condensing propylene oxide with propylene glycol, and having an average molecular weight of 3400, comprising applying said composition to a dry denture, immersing said denture in warm water for about 15 minutes and rinsing the denture in water.

4,066,567

LIQUID CRYSTAL CUMULATIVE DOSIMETER

Mortimer M. Labes, Philadelphia, Pa., assignor to Temple University, Philadelphia, Pa.

Filed Feb. 4, 1976, Ser. No. 655,080

Int. Cl.² C09K *3/34;* G01K *3/00, 11/16*

U.S. Cl. 252—299 **18 Claims**

1. A cholesteric liquid crystal composition comprising a cholesteric liquid crystal solvent and reactive solutes adapted to enter into a chemical reaction, said liquid crystal solvent having a wavelength of maximum reflection the temperature dependence of which is negligible at the temperatures involved in the reaction, the rate of said reaction being temperature dependent, the products of said reaction being adapted to cause a characteristic change in the light reflecting properties of said composition, the degree of said change being cumulatively indicative of the exposure of said composition to temperature outside of a preselected limit.

4,066,568

METHOD OF PRODUCING MICROCAPSULES

Atushi Nakazawa, and Muneichi Ono, both of Yonago, Japan, assignors to Nippon Pulp Industry Company Limited, Tokyo, Japan

Filed July 30, 1976, Ser. No. 710,104

Claims priority, application Japan, Aug. 7, 1975, 50-95433; May 27, 1976, 51-060653

Int. Cl.² B01J *13/02*

U.S. Cl. 252—316 **9 Claims**

1. In a method of producing microcapsules in which hydrophobic material, namely water insoluble powder or oil or oil with a material dissolved therein, is dissolved in gelatin aqueous solution, thereby causing a dispersion emulsion and forming minute particles, and gelatin and coacervate are formed on the surface of the minute cores of the hydrophobic material by adding coacervate forming agent to this system, thereby forming a capsule like film, the improvement wherein a phase is formed which is thick in gelatin by adding phytic acid and/or alkali metal salt or alkaline earth metal salt as said coacervate forming agent, thereby forming capsules around said hydrophobic material cores.

4,066,569

DOPANTS FOR DYNAMIC SCATTERING LIQUID CRYSTALS

Hong Sup Lim, Agoura, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 30, 1975, Ser. No. 645,155

Int. Cl.² C09K *3/34;* G02F *1/13*

U.S. Cl. 252—299 **9 Claims**

1. A doped liquid crystal combination suitable for dc DSM and storage scattering applications comprised of a metallocene formed from a metal selected from the group consisting of Fe, Ru, and Os and (2,4,7-trinitro-9-fluorenylidene)-malononitrile dissolved in a nematic liquid crystal, nematic liquid crystal mixture, or cholesteric-nematic liquid crystal mixture.

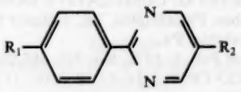
4,066,570

PHENYL-PYRIMIDINES

Arthur Boller, Binningen; Marco Cereghetti, Basel, and Hanspeter Scherrer, Therwil, all of Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 624,354, Oct. 21, 1975, Pat. No. 3,997,536.
This application Sept. 8, 1976, Ser. No. 721,257
Claims priority, application Switzerland, Oct. 25, 1974, 14313/74
Int. Cl.[2] G02F *1/13;* C09K *3/34*
U.S. Cl. 252—299 25 Claims

2. A nematic mixture for electro-optical purposes which comprises one or more compounds of the formula



wherein one of R_1 and R_2 is cyano and the other is straight-chain alkyl of 3 to 9 carbon atoms, straight-chain alkoxy of 2 to 9 cabon atoms or straight-chain alkanoyloxy of 2 to 9 carbon atoms,
and one or more nematic substances.

4,066,571

OLEFIN-POLYMERIZATION CATALYSTS

Alfred Columberg, Geneva, Switzerland, assignor to Battelle Memorial Institute, Carouge, Switzerland

Filed Feb. 13, 1976, Ser. No. 658,112
Claims priority, application Switzerland, Feb. 17, 1975, 1953/75
Int. Cl.[2] C08F *4/62*
U.S. Cl. 252—431 C 4 Claims

1. A process for preparing an olefin polymerization catalyst, in which at least one compound selected from the group which consists of acetates, chlorides and acetyl acetonates of a transition element belonging to group I*b*, II*b*, III*b*, IV*b*, V*b* or VI*b* of the Periodic Table of elements is brought into contact with at least one "acetyl" compound selected from the group consisting of acetic acid, acetic anhydride and the fluoracetic and chloroacetic acids and their anhydrides, the mixture thus obtained is heated to a temperature of 70° to 100° C for a time of 10 to 30 hours, the excess "acetyl" compound is eliminated to give a solid residue, this residue is dispersed in a first inert anhydrous non-polar solvent, part of the dispersion so formed is introduced into an inert anhydrous non-polar organic solvent identical with the first solvent or miscible with it, the quantity introduced being so small that the liquid medium thus obtained remains homogeneous, and at least one aluminum organometallic compound of the general formula $Al_nR_yX_{(3n-y)}$ is introduced into this latter medium, where R is an alkyl group and X is a halogen, and *n* and 1 and *y* is 1, 2 or 3, or *n* is 2 and *y* is 3 or 5, the molar ratio of the aluminum organometallic compound to transition element being from 3.7:1 to 1060:1.

4,066,572

PHOSPHA-ALUMINA GEL AND METHOD OF PREPARATION

Monica E. Choca, Chicago, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Oct. 12, 1976, Ser. No. 731,128
Int. Cl.[2] B01J *27/14*
U.S. Cl. 252—437 15 Claims

1. A catalyst or catalyst support composition consisting essentially of a phospha-alumina which, when dried, formed and calcined has the following properties, where pore volume distributions are determined by nitrogen adsorption and mercury intrusion (a) large average pore diameter greater than 100 A, and (b) minimal small pores, less than 30% of the total pore volume being in pores smaller than 100 A in diameter, said phospha-alumina being obtained by preparing an acidic aqueous solution of at least one water soluble inorganic aluminum salt and at least one water soluble inorganic salt of an acid of phosphorus, adding an alkaline aqueous solution of a water soluble inorganic aluminate in sufficient amount to produce an alkaline pH and to form a coagulated precipitate, separating said precipitate from the residual solution and drying said precipitate in the form of discrete particles.

4,066,573

EMERALD GREEN ALUMINA

William A. Blanton, Jr., San Anselmo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sept. 24, 1976, Ser. No. 726,365
Int. Cl.[2] B01J *27/02, 21/00;* C01B *17/04*
U.S. Cl. 252—439 6 Claims

1. A method for preparing dark emerald green colored alumina, comprising contacting white alumina with a contact material consisting essentially of carbonyl sulfide at an elevated temperature in the range of from about 200°–900° C and for a period sufficient to produce said color.

4,066,574

HYDROCARBON HYDROTREATING CATALYST COMPOSITION

Paul W. Tamm, Greenbrae, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 387,100, Aug. 9, 1973. This application Sept. 24, 1975, Ser. No. 616,334
Int. Cl.[2] B01J *27/02, 23/16, 23/76;* C10G *23/02*
U.S. Cl. 252—439 12 Claims

1. A catalyst composition having an improved catalyst life and suitable for use in hydrodesulfurizing a hydrocarbon feedstock containing organometallic compounds in an amount, calculated as metal in parts by weight, of at least 10 ppm, said composition comprising an alumina support, a Group VIb component and a Group VIII component, said components being selected from the group consisting of the metals, oxides and sulfides of the elements of Groups VIb and VIII, said support having a pore volume in the range from about 0.5 to about 1.1 cubic centimeters per gram and having at least 70 percent of said pore volume in pores having a diameter between 80 and 150 Angstroms and less than 3 percent of said pore volume in pores having a diameter above 1000 Angstroms, said pore size distribution for said support corresponding to values obtained by using mercury porosimetry.

4,066,575

PROCESS FOR THE PREPARATION OF A SUPPORTED SILVER CATALYST

Charles Nathan Winnick, Ridgewood, N.J., assignor to Halcon International, Inc., New York, N.Y.

Filed July 26, 1976, Ser. No. 708,460
Int. Cl.[2] B01J *23/02, 23/04, 23/50*
U.S. Cl. 252—475 15 Claims

1. A process for the preparation of a supported silver catalyst suitable for the production of ethylene oxide by the controlled, vapor phase, partial oxidation of ethylene with molecular oxygen, said catalyst preparation process comprising the following steps:

a. impregnating a porous refractory support with a liquid containing a compound or complex of silver by immersing said support in said liquid and maintaining the support and the liquid in contact until the liquid has been absorbed into the pores of the support;
b. separating the thus-impregnated particles from any non-absorbed remainder of said liquid;
c. activating the thus-impregnated particles by converting the silver compounds or complex to at least one member of the group consisting of silver oxides and elemental silver, at least part of the silver being in elemental form, said conversion being accomplished by heating the impregnated particles in the presence of an essentially oxy-

gen-free inert gas to a temperature at which the silver compound or complex decomposes to yield, at least in part, elemental silver;

d. heating the activated particles in the presence of an oxygen-containing gas at a temperature in the range of 160° – 300° C. for a period of from 0.5 to 24 hours prior to step (e) hereinafter described;

e. depositing upon the activated particles from 4×10^{-5} to 4×10^{-3} gram atoms per kilogram of catalyst of at least one alkali metal of the group consisting of potassium, rubidium, and cesium, said alkali metal being in the form of a salt in solution in a solvent;

f. removing the solvent employed in step (e).

4,066,576
POLYETHYLENE MIXTURE FOR THE MANUFACTURE OF SEMICONDUCTIVE FILMS FOR BAGS AND SACKS

Siegfried Bork, and Georg Sam, both of Frankfurt am Main, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 16, 1976, Ser. No. 677,510
Claims priority, application Germany, Apr. 19, 1975, 2517358
Int. Cl.² H01B *1/04;* C08K *3/04*
U.S. Cl. 252—511 **15 Claims**

1. A polyethylene mixture for the manufacture of semi-conductive films for bags and sacks having a surface resistance of less than $10^6\Omega$ and good mechanical properties, which contains

a. from 60 to 84% by weight of polyethylene having a density of 0.915–0.930 g/cm³, or of a copolymer of ethylene containing up to 5% by weight of comonomers,

b. from 7.5 to 30% by weight of a saturated or weakly unsarated rubber, and

c. from 8.5 to 15% by weight of carbon black,

and optionally usual additives such as stabilizers, procesing auxiliaries or lubricants, wherein the carbon black has a BET surface of from 300 to 1500 m²/g, an oil absorption of from 2.5 to 6.5 ml/g, a content of volatile substances of from 0.1 to 6.0% by weight, a pH of from 7 to 10, and an ash content of from 0.5 to 5.0% by weight.

4,066,577
HIGH MOLECULAR WEIGHT POLYTRIAZINES OF SOLUBLE POLYMERIC N-CYANO-ISOUREA ETHERS

Rudolf Sundermann, New Martinsville, W. Va.; Gunther Rottloff, Cologne, and Ernst Grigat, Odenthal-Gloebusch, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed July 22, 1976, Ser. No. 707,543
Claims priority, application Germany, July 24, 1975, 2533119
Int. Cl.² C08G *73/08*
U.S. Cl. 260—2 R **5 Claims**

1. A mixture which can be converted into a high molecular weight polymer of polytriazine structure which is substantially insoluble in solvents, the mixture comprising:

A. a cyanamide corresponding to the general formula (I):

$$R\ (NH\text{-}CN)_n \qquad (I)$$

in which R represents an aliphatic, cycloaliphatic, heterocyclic or aromatic radical optionally interrupted by at least one oxygen atom, and n is a number from 2 to 5, and

B. an aromatic cyanic acid ester corresponding to the general formula (II):

$$Ar\ (OCN)_p \qquad (II)$$

in which Ar represents an aromatic radical or an aromatic radical interrupted by a bridge member and p is a number from 2 to 5.

4,066,578
HEAVILY LOADED FLAME RETARDANT URETHANE AND METHOD

Robert M. Murch, Ashton; Mary Lynn Wilson, Baltimore, and Louis Leonard Wood, Rockville, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

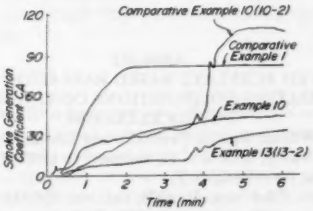
Filed Jan. 14, 1976, Ser. No. 649,127
Int. Cl.² C08G *18/10, 18/14;* C08K *3/22*
U.S. Cl. 260—2.5 AG **15 Claims**

1. In a cross-linked hydrophilic polyurethane foam system having flame retardancy, and three-dimensional network which consists essentially of the reaction product of a first component comprising either an isocyanate capped hydrophilic polyoxyethylene polyol resin prepolymer having an ethylene oxide content ranging from about 40 mole % to 100 mole % of the oxyalkylene units in said prepolymer, said prepolymer having an isocyanate functionality equal to 2 and crosslinking agent having a reaction functionality greater than two, said crosslinking agent selected from the group consisting of polyol, polyamine, polythiol or polyisocyanate; or said isocyanate capped polyol with an isocyanate functionality greater than 2; and a second component comprising water, wherein the H_2O Index Value of said isocyanate capped polyol and water is about 1,300 to about 78,000 wherein the polyoxyethylene polyol moiety has a weight average molcular weight of about 200 to about 20,000, and a hydroxyl functionality of about 2 to about 8, and a surfactant, the improvement which consists essentially of a combination of alumina hydrate powder having an average particle size of about 0.5 to about 120 microns and wherein alumina hydrate is present in an amount from about 50 to about 400 parts by weight per 100 parts by weight of said prepolymer resin, and a nonionic suspending agent, said surfactant being a cationic or amphoteric surfactant.

4,066,579
FLAME- AND SMOKE-RESISTANT FLEXIBLE POLYURETHANE FOAM AND A METHOD FOR PRODUCING SAID FOAM

Toshio Yukuta, Tokyo; Takashi Ohashi, Iruma; Minoru Kojima; Akira Suzuki, both of Tokyo, and Yoshiko Taniguchi, Tokyo, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Mar. 28, 1975, Ser. No. 563,234
Claims priority, application Japan, Mar. 30, 1974, 49-35138; May 31, 1974, 47-61528
Int. Cl.² C08G *18/14, 18/32, 18/48*
U.S. Cl. 260—2.5 AP **4 Claims**



1. A method for producing flame- and smoke-resistant flexible polyurethane foam which comprises reacting a polyisocyanate, in the presence of a surfactant, catalysts, and blowing agents with a mixture of:

A. a polyoxypropylene triol containing secondary hydroxyl group of at least 50 mole % of total hydroxyl content and having a number average molecular weight ranging from 3,000 to 6,000; and

B. a low molecular weight polyhydroxyl compound selected from trimethylolpropane and glycerin,

wherein an equivalent weight ratio of said low molecular weight polyhydroxyl compound (B) to said polyoxypropylene triol (A) being from 0.7 to 1.5 and said surfactant being selected

from the group consisting of the surfactants for semi-rigid, rigid polyetherurethane foam, and polyesterurethane foam.

4,066,580

PROCESS FOR THE MANUFACTURE OF POLYISOCYANURATE FOAMS

Georg Falkenstein, Neustadt; Gerhard Fahrbach, Plankstadt, both of Germany, and Harald Wulff, Baton Rouge, La., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed June 7, 1976, Ser. No. 693,502
Int. Cl.[2] C08G *18/20*
U.S. Cl. 260—2.5 AW 7 Claims

1. In a process for the manufacture of polyisocyanurate foams containing urethane groups by reaction of organic polyisocyanates and polyols in the presence of a catalyst system with or without further components such as frothing agents, auxiliaries and additives, wherein the improvement consists of using catalytic amounts of a co-catalyst comprising 1,3,5-tris-(N,N-dialkylaminoalkyl)-s-hexahydrotriazine, and an organic mono- or polycarboxylic acid with 1 to 14 carbon atoms, or a monoester of the polycarboxylic acids; wherein the co-catalyst system is used at a mole ratio of 1,3,5-tris-(N,N-dialkylaminoalkyl)-s-hexahydrotriazine to organic mono- or polycarboxylic acids or monoesters of the polycarboxylic acids of 30:1 to 0.7:1.

4,066,581

PROCESS FOR PRODUCING A BOND BETWEEN POLYVINYLENE GLYCOL AND A SUBSTANCE CONTAINING PRIMARY AMINO GROUPS

Axel Sieber, Marburg an der Lahn, Germany, assignor to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Germany

Filed Feb. 24, 1977, Ser. No. 771,766
Claims priority, application Germany, Feb. 26, 1976, 2607766
Int. Cl.[2] C08F *18/24;* A61K *31/74;* C07G *7/02;* B01F *7/16*
U.S. Cl. 260—8 7 Claims

1. A process for producing a bond between polyvinylene glycol and a substance containing primary amino groups, which comprises treating said polyvinylene glycol with a medium to strong oxidant until a sufficient number of aldehyde groups is formed and then reacting the oxidation product with the substance containing primary amino groups.

4,066,582

IMPROVED ACRYLATE BASED RADIATION CURABLE COATING COMPOSITIONS CONTAINING NITROCELLULOSE

Gunther William Babian, Peekskill, and Edward Bruce Harris, Spring Valley, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 27, 1976, Ser. No. 726,733
Int. Cl.[2] C08L *1/18*
U.S. Cl. 260—17 A 9 Claims

1. In an acrylate or methacrylate-based radiation curable coating composition containing at least 10 weight percent of an oligomeric polyacrylate or polymethacrylate having a molecular weight from 800 to 5,000 and an average of 1 to 8 acrylyl groups per 1,000 molecular weight units, the improvement of having present in said radiation curable coating composition from 0.25 to 9 weight percent of nitrocellulose having a viscosity of $\frac{1}{4}$ second to $\frac{1}{2}$ second, measured by the falling ball method described in ASTM D301-56(65) and ASTM D1343-56(65), and an average nitrogen content from 10.9 to 12.2 weight percent.

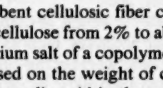
4,066,583

FLEXIBLE WATER ABSORBENT POLYMER COMPOSITIONS COMPRISING (A) UNSATURATED CARBOXYLIC ACID, ACRYLIC ESTER CONTAINING ALKYL GROUP 10-30 CARBON ATOMS, ADDITIONAL MONOMER PLUS (B) ALIPHATIC DIOL

David Chantrill Spaulding, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 16, 1977, Ser. No. 796,914
Int. Cl.[2] C08L *5/00;* C08F *218/02, 218/14*
U.S. Cl. 260—17.4 SG 20 Claims

1. A composition of (A) an interpolymer of monomers comprising from about 40 to 87 weight percent of an olefinically unsaturated carboxylic acid monomer, 2 to 20 weight percent of (1) an acrylic ester monomer of the formula



where R′ is hydrogen, methyl or ethyl and R contains 10 to 30 carbon atoms and 5 to 30 weight percent of (2) at least one other acrylic or methacrylic nitrile, amide or ester, and (B) greater than about 30 weight parts per 100 of interpolymer of an aliphatic dial.

4,066,584

ALLOY FIBERS OF RAYON AND COPOLYMERS OF ACRYLIC AND METHACRYLIC ACIDS

Thomas C. Allen, and David B. Denning, both of Asheville, N.C., assignors to Akzona Incorporated, Asheville, N.C.

Filed Aug. 11, 1975, Ser. No. 603,483
Int. Cl.[2] A61F *13/20;* C08L *1/02*
U.S. Cl. 260—17.4 CL 9 Claims

1. A highly absorbent cellulosic fiber containing in a physical admixture with cellulose from 2% to about 40% of an alkali metal salt or ammonium salt of a copolymer of acrylic acid and methacrylic acid based on the weight of cellulose, the ratio of acrylic acid to methacrylic acid in the copolymer being from 90:10 to 10:90 by weight.

4,066,585

PRINTING INKS AND PRINTING METHODS EMPLOYING THE SAME

Horst Schepp, Unna, and Manfred Drawert, Froendenberg, both of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed Aug. 3, 1976, Ser. No. 711,147
Claims priority, application Germany, Aug. 5, 1975, 2534845
Int. Cl.[2] C08G *69/26*
U.S. Cl. 260—18 N 15 Claims

2. A solvent-free printing ink, solid at room temperature but molten at printing temperatures, said ink having a viscosity of not more than 0.5 Pas at printing temperatures and comprising a pigment and a thermoplastic binder having a softening point between 90° C. and 160° C., said binder comprising a synthetic resin having an average molecular weight between about 1500 and 3000 and being selected from the group consisting of polyamide resins and polyesteramide resins, said polyamide resins being the condensation product of approximately equivalent amounts of (1) an acid component comprising a dimerized fatty acid and a monocarboxylic acid and (2) an amine component comprising a diamine, and said polyesteramide resins being the condensation product of approximately equivalent amounts of (1) an acid component comprising a dimerized fatty acid and a monocarboxylic acid and (2) an amine component comprising a diamine and at least one member selected from the group consisting of diols and alkanolamines, said acid component (1) of said polyamide and polyesteramide resins optionally comprising codicarboxylic acids and cyclic acid anhydrides, the equivalence ratio of the combined dimerized fatty acid and optional co-dicarboxylic acid to the total

monocarboxylic acid and optional cyclic acid anhydride being from 0.5:0.5 to 0.3:0.7.

4,066,586
POLYESTER-MODIFIED VINYL POLYMER AND PRODUCTION METHOD THEREOF

Tuneo Tanuma, and Teruo Yoshida, both of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Japan

Filed July 21, 1976, Ser. No. 707,351
Claims priority, application Japan, July 24, 1975, 50-90551
Int. Cl.[2] C09D *3/52, 3/66*
U.S. Cl. 260—22 CB 20 Claims

1. A process for producing a polyester-modified vinyl polymer for use in a high-solids coating composition, which comprises graft-polymerizing 97 to 50% by weight of at least one vinyl monomer selected from the group consisting of an acrylic monomer, styrene, a styrene derivative, acrylonitrile, acrylamide, vinyl chloride and vinyl acetate, in the presence of 3 to 50% by weight of a polyester having an oil length of 5 to 20%, an average molecular weight of 1,000 to 6,000, and an α,β-unsaturated dicarboxylic acid component content of 1 to 5% by weight on the polyester, by use of 5% by weight or more (based on monomeric component) of an azobisnitrile catalyst.

4,066,587
THERMOPLASTIC POLYESTER COMPOSITIONS CONTAINING POLYAMIDE ADDITIVES

Harold E. Mains; Frederick R. Williams, and William L. O'Brien, all of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed Sept. 7, 1976, Ser. No. 720,555
Int. Cl.[2] C08G *63/02;* C08L *77/12*
U.S. Cl. 260—22 D 13 Claims

1. A method for improving the flow characteristics and rheological properties of thermoplastic polyester and copolyester resins which comprises incorporating therein 0.01% to 20% by weight of a polyamide having a number average molecular weight from about 5,000 to 50,000 obtained by the reaction of a high molecular weight aliphatic or cycloaliphatic dibasic acid containing from 18 to 52 carbon atoms and up to 30 weight percent, based on the total acid charge, of a short-chain, saturated, aliphatic dibasic acid containing from 2 to 13 carbon atoms with an aliphatic saturated diamine containing from 2 to 10 carbon atoms or a mixture of said diamines.

9. An improved resin composition comprising a thermoplastic polyester or copolyester resin and from 0.01 to 20% by weight, based on the weight of said resin, of a high molecular weight polyamide obtained by the reaction of a high molecular weight aliphatic or cycloaliphatic dibasic acid having from 18 to 52 carbon atoms and up to 30 weight percent, based on the total dibasic acid charge, of a short-chain, saturated, aliphatic dibasic acid containing from 2 to 13 carbon atoms with an aliphatic, saturated diamine containing from 2 to 10 carbon atoms or a mixture of said diamines, said polyamide having a number average molecular weight from about 5,000 to 50,000 a softening point in the range 100° C to 240° C and amine value less than three.

4,066,588
COLD-CURING BINDER FOR FOUNDRY SAND CORES AND MOLDS

Kyohei Funabiki; Noriaki Matsushima; Toshiyuki Tachikawa, and Kazuichi Ikeda, all of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Sept. 27, 1976, Ser. No. 727,327
Claims priority, application Japan, Oct. 3, 1975, 50-118805
Int. Cl.[2] B22C *1/22;* C08G *63/48, 71/04*
U.S. Cl. 260—22 TN 14 Claims

1. A cold-curing binder for foundry sand cores and molds which comprises:

a. a tall oil fatty acid-modified alkyd resin prepared from components comprising a polybasic acid, a polyhydric alcohol, and a mixture of tall oil fatty acid, having a fatty acid content of at least about 90%, and linseed oil in a weight proportion of tall oil fatty acid to linseed oil in the range of from about 50:50 to about 70:30,

b. a polyisocyanate, present in the amount of about 5 to about 40 percent by weight of resin, and

c. a curing accelerator.

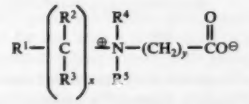
4,066,589
SOLVENT REPELLENT COMPLEXES

Nathaniel P. Langford, Somerset, Wis., and Edward W. Perrault, Roseville, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 23, 1975, Ser. No. 580,197
Int. Cl.[2] C08L *33/02*
U.S. Cl. 260—29.6 H 16 Claims

1. Complex formed by mixing together in an aqueous medium a water-soluble zwitterionic polymer selected from the group consisting of

a. polymers comprising carboxy betaines having the repeating formula



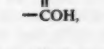
wherein R^1 is acrylate, methacrylate, acrylamide or methacrylamide; R^2 and R^3 are hydrogen or alkyl having 1 to 3 carbon atoms; R^4 and R^5 are hydrogen or alkyl having 1 to 6 carbon atoms; x and y are integers from 1 to 3 inclusive;

b. copolymers comprising monomers (1) and (2) shown below:

1. substituted acidic vinyl monomers of the formula

$$CR^7H{=}CR^8CO_2H$$

wherein R^7 is hydrogen or

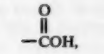


and R^8 is hydrogen, chlorine or $-CH_3$; and

2. substituted basic vinyl monomers having the general formula

$$CH_2{=}CR^6COQ$$

wherein R^6 is hydrogen or $-CH_3$, and Q is an organic radical containing a basic nitrogen-containing group, wherein said acidic and basic functionalities are retained in the copolymer structure and wherein the mole ratio of basic monomer to acidic monomer in said copolymer is from 40/60 to 70/30, except where R^7 is



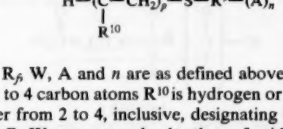
the mole ratio is 57/43 to 82/18, **with a fluorocarbon compound selected from the group consisting of**

a. $(R_f)_d-(W)_m-(A)_n$ wherein R_f is a monovalent fluorinated saturated non-aromatic aliphatic radical having 5 to 20 carbon atoms in the skeletal chain; W is a polyvalent linking radical free from functional groups which react with water; A is

$-SO_3H$, $-OSO_3H$,

or $-OPO_3H_2$; d is one or two; m is zero or one, n is one or two, except when A is

m may be two, and when m is zero d is one, and salts thereof, said compound containing at least 40 percent by weight of fluorine derived by the R_f portion; and



wherein R_f, W, A and n are as defined above, R^9 is alkyl having 1 to 4 carbon atoms R^{10} is hydrogen or methyl, p is an integer from 2 to 4, inclusive, designating the same or different R_f-W groups; and salts thereof said compound containing at least 40 percent by weight of fluorine derived from the R_f portion;

wherein the ratio of the amine equivalence of said zwitterionic polymer to the acid equivalence of said fluorocarbon is 1/1 to 150/1.

4,066,590

ETHYLENE-PROPYLENE ELASTOMERS AND ETHYLENE-PROPYLENE-DIENE ELASTOMERS WITH IMPROVED HEAT AND OIL RESISTANCE

Roger J. Eldred, Detroit; Stanley A. Iobst, Sterling Heights, and Ismat A. Abu-Isa, Birmingham, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 13, 1976, Ser. No. 714,027

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—28.5 A **5 Claims**

1. A high temperature and oil resistant elastomer composition comprising the peroxide-induced reaction product of, by weight,

100 parts of an elastomeric polymer selected from the group consisting of ethylene-propylene rubber and ethylene-propylene-diene rubber,

about 10 to 35 parts of a crosslinking monomer selected from the group consisting of trimethylolpropane trimethacrylate, triallyl isocyanurate, polyethylene glycol dimethacrylate and ethylene glycol dimethacrylate,

at least 6 parts of a chlorinated or brominated organic material that contains at least 30% of said halogen and is non-fugitive from said product at 350° F.,

about 0.025 to 0.055 equivalent per 100 parts of said polymer of a ditertiary butyl group hindered phenolic antioxidant that does not prevent said peroxide-induced reaction and 10 to 25 parts of zinc oxide,

said composition having a volume swell no greater than 130% when immersed in ASTM #3 oil at 150° C. for 70 hours (ASTM D-471-68) and having an ultimate elongation of about 90% or more after aging 168 hours at 177° V. (ASTM D-573-67).

4,066,591

WATER-REDUCED URETHANE COATING COMPOSITIONS

Roger L. Scriven, and Wen-Hsuan Chang, both of Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 2, 1975, Ser. No. 582,946

Int. Cl.[2] C08L *75/12*

U.S. Cl. 260—29.2 TN **33 Claims**

1. A non-sedimenting aqueous dispersion which is emulsifiable in the absence of added emulsifier of an ungelled polyurethane having a finely particulated dispersed phase of less than 10 microns which requires only mild agitation for dispersion formed by reacting in aqueous medium in which water is the principal ingredient:

A. NCO-containing polymer containing anionic salt groups having monovalent counter ions and having a salt group equivalent weight of 200 to 5000 being substantially free of highly active hydrogens, and having a viscosity of 50 to 10,000 centipoises, said polymer formed from:

1. an organic polyisocyanate and

2. an active hydrogen-containing material containing at least 2 active hydrogens per molecule,

said organic polyisocyanate and said active hydrogen-containing compound containing a total of not more than 1 gram-mole of compounds having a functionality of 3 or more per 500 grams of organic polyisocyanate and active hydrogen-containing material; the equivalent ratio of NCO in (1) to active hydrogen in (2) being at least 4/3; the anionic salt groups introduced into said NCO-containing polymer through the active hydrogen-containing material (2);

B. active hydrogen-containing material in which the active hydrogens are more reactive with NCO groups than water to form a polyurethane having an intrinsic viscosity less than 4.0 deciliters per gram; the ratio of active hydrogen groups in (B) to NCO groups in (A) being less than 2:1;

said aqueous dispersion containing at least 15 percent by weight aqueous medium based on total weight of ungelled polyurethane and aqueous medium of which at least 30 percent by weight of the aqueous medium is water with co-solvent constituting the remainder of the aqueous medium.

4,066,592

ZWITTERION-CONTAINING COMPOSITIONS

Marco Wismer, Gibsonia, and Joseph F. Bosso, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 167,476, July 29, 1971, Pat. No. 3,928,156, which is a continuation-in-part of Ser. No. 840,848, July 10, 1969, abandoned. This application July 25, 1975, Ser. No. 599,260

Int. Cl.[2] C25D *13/06*

U.S. Cl. 260—29.2 EP **8 Claims**

1. An ungelled, inherently water-dispersible, substantially epoxy group free, electrodepositable synthetic organic resin containing Zwitterions, said Zwitterions consisting of a quaternary ammonium base group and a carboxyl group which are derived from the reaction of an epoxy group-containing resin with an amino acid, solutions of said synthetic organic resin being substantially free of dissociated counter-ions.

4,066,593

WATER SOLUBLE WIRE ENAMELS

Thomas S. Czajka, Wheaton, and Richard P. Needham, Woodridge, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 23, 1975, Ser. No. 625,192

Int. Cl.[2] C08L *67/00, 79/08*

U.S. Cl. 260—29.2 E **5 Claims**

1. A water soluble wire enamel having a Class F thermal rating which is the reaction product of the ingredients comprising:

a. from 45 to 55 weight percent of a water soluble polyester

resin which is the reaction product of the ingredients comprising from 25 to 35 weight percent terephthalic acid, from 5 to 15 weight percent trimellitic anhydride, from 10 to 15 weight percent adipic acid, from 25 to 35 weight percent neopentyl glycol, and from 5 to 10 weight percent tris 2-hydroxyethyl isocyanurate, said polyester resin being in the form of a 60 to 80 weight percent solution in an ether glycol;

b. from 3 to 5 weight percent of an ethanol-substituted amine;

c. from 35 to 50 weight percent water; and

d. from 1 to 2.5 weight percent of a triethanolamine titanate crosslinking agent.

4,066,594

PROCESS FOR PREPARING A POLYSILOXANE

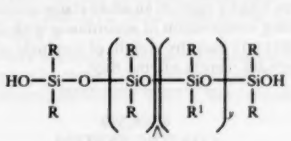
Richard E. Moeller, Troy, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 533,958, Dec. 18, 1974, Pat. No. 4,008,346. This application Aug. 4, 1976, Ser. No. 711,517

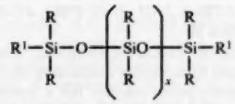
Int. Cl.[2] C08J *3/00*

U.S. Cl. 260—29.2 M **9 Claims**

1. A process for preparing a polysiloxane having the fromula:



or



wherein R is a monovalent hydrocarbon radical free of unsaturation; R^1 is a hydrocarbon radical having vinyl unsaturation; *x* and *y* are positive integers so that the silanol stopped polysiloxane has from 0.1 to 1% by weight of R^1 groups and the viscosity of the polymer ranges between 25,000 centipoises and 1,000,000 centipoises said process comprising:

a. homogenizing a mixture which consists essentially of:

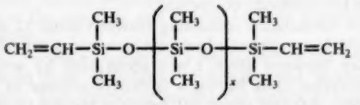
i. a compound of the formula $(R_2SiO)_4$ wherein R is a monovalent hydrocarbon free of unsaturation; or

ii. a compound of the formula:

$(RR^1SiO)_4$

wherein R is the same as hereinabove defined and R^1 is a hydrocarbon radical having vinyl unsaturation; and

iii. a benzene sulfonic acid compound of the formula:



wherein R^2 is an alkyl group of from 6–18 carbon atoms and;

iv. water;

b. heating the homogenized mixture of (a) to form said polysiloxane; and

c. adding a neutralizing amount of an alkanolamine to said mixture to neutralize said benzene sulfonic acid.

4,066,595

WATER-SOLUBLE DYE COMPOSITION

Hans-Henning Bunge, Suffern, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 11, 1975, Ser. No. 585,990

Int. Cl.[2] C08L *61/28*

U.S. Cl. 260—29.4 R **14 Claims**

1. A water-soluble composition comprising

a. 0.01% to 40% of a dye which is soluble in water-miscible solvents and insoluble solely in water;

b. 1.0% to 88% of a water-miscible solvent or mixture of solvents which is inert to said dye;

c. 0.1% to 89% of a water-soluble resin;

d. 10% to 98% water; and optionally, a basic compound to raise the pH of the solution to about 10.

4,066,596

AEROSOL DISPENSED LATEX PAINT AND PACKAGE CONTAINING THE SAME

David Stern, Roslyn, N.Y., assignor to Martin Paint & Chemical Corporation, Jamaica, N.Y.

Continuation-in-part of Ser. No. 168,916, Aug. 4, 1971, abandoned. This application Jan. 17, 1975, Ser. No. 541,850

Int. Cl.[2] C08J *3/20;* **C09D** *5/02, 9/04*

U.S. Cl. 260—29.6 R **5 Claims**

1. An aqueous polyvinyl acetate methyl acrylate copolymer emulsion paint for use with a pressurized container, wherein the paint is disposed within a collapsible piston housed within the pressurized container, a propellant vapor or gas of elevated pressure filling the space between the collapsible piston and the container, and acting against the bottom of the piston, said container having a valve communicating with the interior of the piston and through which the contents of the piston are discharged as the piston is compressed under the action of the propellant as the valve is opened, said valve being connected to a discharge nozzle, the polyvinyl acetate and methyl acrylate components of the copolymer being present in the proportion of 80:20, and wherein the paint comprises approximately 2–15% of a pigment suspended in approximately 98–85% of a vehicle comprising predominantly water and said copolymer, the copolymer constituting approximately 35% of the vehicle, said paint containing also small proportions of a surfactant and an anti-foam agent, and having a viscosity in the range of 10 to 60 sec., as measured on the No. 4 Ford cup (20 to about 209 cps.) at room temperature, said paint being discharged by the nozzle in the form of a spray from the collapsing piston on opening of the valve and substantially without foaming and thereby yielding a substantially uniform coating owing to the absence of the propellant in the paint.

4,066,597

METHOD OF FINISHING SYNTHETIC ORGANIC FIBROUS MATERIAL, IN PARTICULAR OF PROVIDING IT WITH AN ANTISTATIC FINISH

Horst Jäger, Bettingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 10, 1975, Ser. No. 639,312

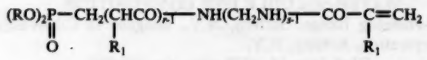
Claims priority, application Switzerland, Dec. 20, 1974, 17038/74; Dec. 20, 1974, 17037/74; Dec. 20, 1974, 17036/74

Int. Cl.[2] C08F *220/58, 220/60*

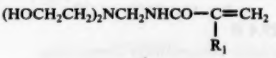
U.S. Cl. 260—29.6 WB **11 Claims**

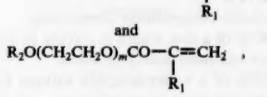
1. An aqueous or organic solution or emulsion for providing synthetic organic materials with an antistatic and dirt repellent finish containing 1-30 percent by weight of a composition consisting essentially of

a. 75 to 100 percent by weight of a copolymer having a molecular weight between about 2,000 and 50,000 of at least two monomers in a ratio of about 1:10 to 10:1 and of the formulae



(1)





and

or mixtures of such copolymers

wherein

R is straight-chain or branched alkyl of 1 to 8 carbon atoms,

R_1 is hydrogen or methyl,

R_2 is alkyl of 1 to 6 carbon atoms,

m is an integer from 6 to 15 and each of *r* and *s* is 1 or 2;

or said copolymer of at least two of (1), (2) and (3)

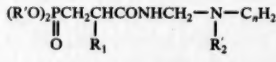
containing an additional monomer in a ratio of about 1:10 to 10:1 and selected from the group consisting of vinyl esters of organic acids, vinyl alkyl ketones, vinyl halides, acrylic nitrile or acrylic amide and derivatives thereof, which are substituted at the amide nitrogen and α, β-unsaturated monomor dicarboxylic acids containing 3 to 5 carbon atoms and esters thereof; and

b. 25 to 0 percent by weight of at least one of

b_1. a homopolymer of (1), (2) or (3) having a molecular weight of about 2,000 to 50,000;

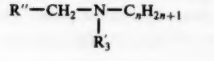
b_2. a homopolymer or copolymer of vinyl esters of organic acids, vinyl alkyl ketones, vinyl halides, acrylic nitrile or acrylic amide or derivatives thereof which are substituted at the amide nitrogen, or α, β-unsaturated mono- or dicarboxylic acids containing 3 to 5 carbon atoms or esters thereof, and having a molecular weight between about 2,000 and 50,000;

b_3. a compound of the formula

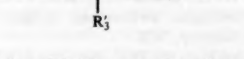


wherein R' is straight-chain or branched alkyl of 1 to 18 carbon atoms, R_1 is hydrogen or methyl, R_2' is hydrogen or C_nH_{2n+1} and *n* is an integer from 1 to 24; and

b_4. a compound of the formula

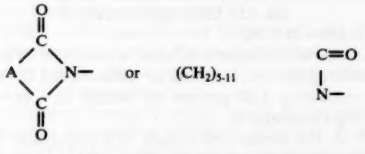


wherein R'' is



(5)

wherein A is $-CH_2CH_2-$, $-CH=CH-$ or



R_3' is hydrogen or C_nH_{2n+1} and *n* is an integer from 1 to 24.

4,066,598

ZINC ENRICHED LITHIUM SILICATE-LATEX COATING COMPOSITION

Ronald W. Beers, Spring, Tex., and Julian Lakritz, Edison, N.J., assignors to Matcote Company, Inc., Tex.

(2) **Division of Ser. No. 319,969, Dec. 29, 1972, Pat. No. 3,884,863, which is a continuation-in-part of Ser. No. 93,389, Nov. 27, 1970, abandoned, which is a continuation-in-part of Ser. No. 708,785, Feb. 28, 1968, abandoned. This application Nov. 29, 1974, Ser. No. 528,526**

Int. Cl.[2] **C08L** *9/04, 9/08, 13/02;* **C09D** *5/10*

U.S. Cl. 260—29.7 S **7 Claims**

1. A homogeneous vehicle for a zinc-enriched, self-curing, water-resistant coating composition consisting essentially of:

a. between about 57 to 91 parts of an aqueous alkali-lithium silicate solution, said alkali and lithium silicates being employed in amounts sufficient to provide a molar ratio of X_2O, where X is selected from the group consisting of sodium, potassium, and quaternary ammonium, to lithium oxide to silicon dioxide, respectively, within the range from about 0.25 to 0.65 X_2O : 0.35 to 0.75 Li_2O : 2.5 to 4.5 SiO_2;

b. between 9 and 40 parts of a film-forming organic alkali stable latex of an interpolymer selected from the group consisting of interpolymers of acrylonitrile/butadiene/styrene, of styrene/butadiene/maleic acid, of styrene/butadiene/itaconic acid and of styrene/butadiene; and

c. between 0 and 3 parts of an alkali stable anionic surfactant.

6. A coating composition in accordance with claim **1** which comprises 20 to 33 parts by weight of a vehicle of claim **1**, and 67 to 80 parts by weight of zinc dust.

4,066,599

COATING SYSTEM

Robert A. Zimmerman, 6601 Rockbrook, St. Louis, Mo. 63133

Filed May 12, 1975, Ser. No. 576,556

Int. Cl.[2] **C08K** *5/01, 5/49;* **C08L** *47/00, 75/04*

U.S. Cl. 260—30.6 R **13 Claims**

1. A liquid rubber precursor formulation adapted for reaction with a second formulation containing isocyanate groups to provide a moisture-proof barrier for a substrate, said liquid rubber precursor formulation comprising between about 12 and about 32% by weight of a hydroxyl terminated butadiene polymer, between about 2 and about 14% by weight of a polyether triol having a hydroxyl number of between about 300 and about 500, between about 0.08 and about 0.8% by weight of an organo-mercury catalyst, between about 2 and about 10% by weight carbon black, between about 2 and about 24% by weight of a low oil absorbency silica, between about 0.1% and about 1% by weight of fumed silica as a suspending agent for the low oil absorbency silica, between about 0.08 and about 2% by weight of a molecular sieve dessicant, up to about 8% by weight of an organic solvent selected from a group consisting of aromatic solvents, ketones, esters and glycol ethers, and lecithin in an amount sufficient to provide a formulation viscosity of not greater than about 20,000 cps at 27° C. and at which a reactive mixture prepared from said precursor formulation and said formulation can be readily sprayed onto a substrate.

7. A system adapted for the application of a moisture-proof barrier to a substrate comprising:

a first formulation containing between about 12 and about 32% by weight of a hydroxyl terminated butadiene polymer, between about 2 and about 14% by weight of a polyether triol having a hydroxyl number of between about 300 and about 500, between about 0.08 and about 0.8% by weight of an organo-mercury catalyst, between about 2 and about 10% by weight carbon black, between about 2 and about 24% by weight of a low oil absorbency silica, between about 0.1% and about 1% by weight of fumed silica as a suspending agent for the low oil absorbency silica, between about 0.08 and about 2% by weight of a molecular sieve dessicant, up to about 8% by weight

of an organic solvent selected from the group consisting of aromatic solvents, ketones, esters and glycol ethers, and lecithin in an amount sufficient to provide a formulation viscosity of not greater than about 20,000 cps at 27° C. and at which a reactive mixture prepared from said first formulation and a second formulation containing isocyanate groups can be readily sprayed onto a substrate; and

a second formulation containing a urethane prepolymer derived from a polypropylene glycol ether polyol and toluene diisocyanate, containing between about 13 and 17% by weight free isocyanate groups;

the two formulations of said system being adapted for mixing to provide a reactive mixture for application to said substrate; said system comprising defined relative proportions of said formulations so as to provide a molar ratio of at least about 1.1 isocyanate groups per hydroxyl group in said reactive mixture, said first and second formulations being adapted for mixing to form said reactive mixture at the site of the substrate to be coated.

4,066,600
FRICTION-ACTIVATABLE ADHESIVE AND ARTICLES THEREOF

Wayne A. Pletcher, Roseville, and Roy Wong, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 17, 1975, Ser. No. 632,573
Int. Cl.² C08K *5/12, 5/51;* **C08L** *67/02, 93/00*
U.S. Cl. 260—30.6 R **12 Claims**

7. An adhesive applicator stick comprising a mixture of

1. 25 to 95 parts by weight of a thermoplastic linear polyester having crystallizable ester units of the formula

$$-CR_1C(=O)-OR_2O-$$

wherein R_1 consists of the divalent radical remaining after removal of the carboxyl groups from one or more saturated aliphatic dicarboxylic acids and/or aromatic dicarboxylic acids, R_1 containing from 2 to 8 carbon atoms when it is an aliphatic radical and 6 to 13 carbon atoms when it is an aromatic radical, R_2 consists of the divalent radical remaining after removal of the hydroxyl groups from one or more saturated aliphatic diols containing from 2 to 12 carbon atoms, said polyester having a DTA melting temperature of from about 40° to 75° C. and an inherent viscosity of at least 0.2 dl/g at 25° C., as measured in a 0.5 g/dl solution of polymer in chloroform at 25° C.,

2. 5 to 50 parts by weight of a low molecular weight thermoplastic resin tackifier for the polyester selected from hydrocarbon resins, reaction products to hydroabietyl alcohol and toluene diisocyanate, bituminous asphalts, coal tar pitches, rosins, phenolic resins, chlorinated aliphatic hydrocarbon waxes and chlorinated polynuclear aromatic hydrocarbona, the phenolic resins being reaction products of one or more members of the class consisting of phenol itself, cresols, xylenols, p-tert-butylphenol and p-phenylphenol with one or more members of the class consisting of formaldehyde, acetaldehyde and furfuraldehyde, said tackifier having the ability to lower the melting temperature of the polyester and to raise its glass transition temperature,

3. 0 to 25 parts by weight of a plasticizer for the polyester selected from phthalates, phosphates and hydroabietyl alcohol, said plasticizer having the ability to lower the melting temperature and glass transition temperature of the polyester and to reduce its cohesive strength, the sum of (1), (2) and (3) being 100 parts by weight, said mixture being compatible and having

a. a softening temperature of at least about 40° C.,
b. a write on factor of at least about 0.06,
c. an open time of from about ½ to about 10 minutes,
d. peel adhesion in the open state of not less than about 50 grams per centimeter, and
e. peel adhesion in the closed state of not less than about 100 grams per centimeter.

4,066,601
OXADIAZOLE POLYMERS

Alexander Blackhall; Donald Lithgow Brydon, and John David Seddon, all of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 24, 1975, Ser. No. 634,751
Claims priority, application United Kingdom, Nov. 29, 1974, 51783/74
Int. Cl.² C08K *5/36*
U.S. Cl. 260—30.8 R **6 Claims**

1. A method for the production of a brominated, polyphenylene-1,3,4-oxadiazole solution having a viscosity above the minimum for subsequent effective extrusion, which comprises

a. forming a precursor solution of a polyphenylene-1,3,4-oxadiazole polymer by reacting at least one acid, selected from the group consisting of isophthalic acid and terephthalic acid, in oleum having a strength in the range 5 to 60%, with a compound selected from the group consisting of hydrazine and hydrazine salts in amounts such that the polymer has —COOH end groups making it capable of further polymerization, and the solution has a viscosity below the minimum for subsequent effective extrusion,
b. adding bromine to the precursor solution to brominate the polymer; and then
c. adding a compound selected from the group consisting of hydrazine and hydrazine salts to further polymerize the brominated polymer to an extent which effects an increase in the viscosity of the solution to or above the minimum for subsequent effective extrusion.

4,066,602
ABRASION RESISTANT ELASTOMERIC COMPOSITION

Michael A. Pellico, 3426 Jasmine, Los Angeles, Calif. 90034

Filed Oct. 12, 1976, Ser. No. 731,521
Int. Cl.² C08K *5/01, 5/02, 5/06, 5/07*
U.S. Cl. 260—30.8 R **11 Claims**

1. Abrasion resistant elastomeric compositions for filling, sealing and coating, comprising:

from about 10 to about 50 wt.% of an elastomeric block copolymer selected from the group consisting of polystyrene-polybutadiene-polystyrene copolymer, polystyrene-polyisoprene-polystyrene copolymer and mixtures of said copolymers, wherein the average molecular weight for each polystyrene block is from about 2,000 to about 100,000, and the average molecular weight for each of said polybutadiene and polyisoprene blocks is from about 25,000 to about 1,000,000;

from about 10 to about 40 wt.% of silica having a specific gravity from about 2.40 to about 2.66; and

a solvent for the elastomeric block copolymer to make up 100 wt.% of the composition, with the concentration of said solvent in said composition being at least about 20 wt.%.

4,066,603
SULFUR CONTAINING SILICONE ELASTOMER AND METHOD OF PREPARATION

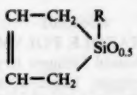
Gary R. Homan, and Chi-Long Lee, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 3, 1976, Ser. No. 663,325
Int. Cl.² C08G *77/04*
U.S. Cl. 260—37 SB **19 Claims**

1. A composition curable to an elastomer comprising a material prepared by mixing

A. 5 to 95 weight percent based on the combined weight of (A) and (B) of a polydimethylsiloxane having a viscosity

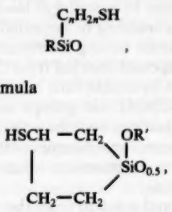
of at least 0.3 Pa·s at 25° C. and being endblocked with a siloxy unit selected from the group consisting of methylphenylvinylsiloxy units, dimethylvinylsiloxy units and units of the formula



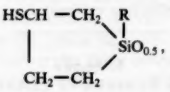
wherein R is a monovalent radical selected from the group consisting of alkyl radicals of from 1 to 3 carbon atoms inclusive and phenyl radicals,

B. 5 to 95 weight percent based on the combined weight of (A) and (B) of a mercaptoorganopolysiloxane consisting essentially of a combination of units selected from dimethylsiloxane units, trimethylsiloxane units, units of the formula

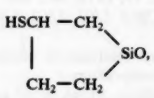
units of the formula



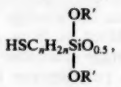
units of the formula



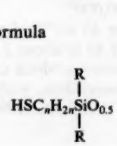
units of the formula



units of the formula



and units of the formula



wherein R is defined above, R′ is methyl or ethyl and *n* has a value of from 1 to 4 inclusive, there being in said mercaptoorganopolysiloxane an average of at least two sulfur containing siloxane units per molecule and no more than 16 weight percent —SH groups based on the weight of the mercaptoorganopolysiloxane, the molecular weight of the mercaptoorganopolysiloxane being at least 1,000, the amount of (A) and (B) being combined in weight ratios sufficient to provide a molar ratio of moles of —SH group in (B) per mole of C=C bond in (A) of 0.1:1 to 15:1,

C. 1.4 to 5.5 parts by weight organic peroxide based on 100 parts by weight of (A) and (B) combined.

4,066,604

BRANCHED POLYPHENYLENE-MICA COMPOSITES

Chen-Shen Wang, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 28, 1976, Ser. No. 736,389
Int. Cl.² C08K *3/34*
U.S. Cl. 260—37 R **10 Claims**

1. A high temperature resistant composite comprising from about 50 to 90 wt. % mica and from about 10 to 50 wt.% branched polyphenylene having at least about 8% by weight of its benzene ring structures bonded to three or more other benzene ring structures.

4,066,605

COMPOSITION FOR REHABILITATING SCORED AND MARRED SURFACES

La Vaughn R. McBride, 1017 Pacific Ave., Half Moon Bay, Calif. 94019; Jack D. Clark, 1708 Whipple Ave., Redwood City, Calif. 94062, and Dale Center, Box 123, Montara, Calif. 94037

Continuation of Ser. No. 688,294, May 20, 1976, abandoned, which is a continuation of Ser. No. 590,568, June 26, 1975, abandoned, which is a continuation of Ser. No. 279,889, Aug. 11, 1972, abandoned. This application Mar. 7, 1977, Ser. No. 774,684
Int. Cl.² C08L *00/00*
U.S. Cl. 260—37 EP **5 Claims**

1. A lubricative composition for restoring damaged areas of surfaces of scored cylinders and pistons and the like consisting essentially of a mixture of 10% to 90% of powdered molybdenum disulfide of particle size no larger than 60 microns and 90% to 10% of an epoxy resin adhesive that cures at temperatures of about 250° F. to 400° F., said resin being a glycidyl ether of bisphenol-A containing a curing agent and having a Brookfield viscosity of 400,000 cps at 75°.

4,066,606

MOULDING COMPOSITIONS INCLUDING AN UNSATURATED POLYESTER

Silvio Vargiu, Casatenovo (Como); Piero Paparatto, Milan; Beppino Passalenti, Lissone (Milan), and Antonio Parodi, Monza (Milan), all of Italy, assignors to Societa Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Oct. 20, 1976, Ser. No. 734,346
Claims priority, application Italy, Oct. 30, 1975, 28813/75
Int. Cl.² C08G *63/54, 63/68*
U.S. Cl. 260—40 R **10 Claims**

1. A granular molding composition suitable for injection molding comprising:

a. from 10 to 50% by weight of an unsaturated polyester consisting of the polycondensation product of a polyhydroxy alcohol selected from the group consisting of 2,2'-bis(4-hydroxycyclohexyl) propane and its halogenated derivatives, and an ethylenically unsaturated dicarboxylic acid selected from the group consisting of maleic and fumaric acids, having the following characteristics:
   — melting point (at the capillary) > 70° C
   — acid value (mg KOH/g) < 50
   — Gardner viscosity (at 25° C in 60 wt.% solution in styrene): from Y to Z_3
b. from 0.2 to 2% by weight of an organic peroxide which decomposes at a temperature above 70° C;
c. one or more inert fillers.

4,066,607

REINFORCED MOULDING COMPOSITION BASED ON THERMOPLASTIC POLYESTERS

Franz Breitenfellner, Bensheim; Lothar Buxbaum, Lindenfels, Odenwald, and Karl Leidig, Heppenheim, all of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 9, 1976, Ser. No. 703,712

Claims priority, application Switzerland, July 22, 1975, 9566/75

Int. Cl.[2] C08K *3/40*

U.S. Cl. 260—40 R 7 Claims

1. A reinforced moulding composition which is based on a thermoplastic polyester and contains (a) a copolyester which is based on poly-1,4-butylene terephthalate and has a crystallisation temperature (T_C) of 35° to 70° C and an amount, which produces this T_C range, of one or more cocomponents which are selected from the group comprising orthophthalic acid, isophthalic acid, 4,4'-diphenylsulphonedicarboxylic acid, 2,2-bis-[4-(hydroxyethoxyphenyl)]-propane, 1,3-bis-hydroxyethyl-5,5-dialkyl-hydantoin, 1,3,3-trimethyl-5-carboxy-3-(p-carboxyphenyl)-indane and 1,4-cyclohexanedimethanol and (b) 2–60% by weight, relative to the total composition, of a reinforcing fibrous filler.

4,066,608

THREE COMPONENT STABILIZER SYSTEM FOR PROPYLENE POLYMERS CONTAINING GRAFTED ACRYLIC ACID WITH OR WITHOUT GLASS FIBER REINFORCEMENT

Robert A. van Brederode, Baytown, Tex., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Sept. 25, 1975, Ser. No. 616,769

Int. Cl.[2] C08K *7/14*

U.S. Cl. 260—42.18 1 Claim

1. A glass reinforced polyolefin composition comprising a major proportion of polyolefin and having outstanding resistance to oxidative degradation containing a synergistic stabilizer combination of

a. 0.15 to 0.25 wt. % of cyclic neopentanetetrayl bis(octadecylphosphite) and

b. 0.5 to 1.3 wt. % of a combination of distearyl thiodipropionate and

c. tris(3,5-di-t-butyl-4-hydroxybenzyl isocyanurate in a ratio of 3 or 4 :1.

4,066,609

CROSSLINKED RESINS PREPARED FROM AN N,N'-BIS-IMIDE AND A SCHIFF BASE

Franklin P. Darmory, and Marianne DiBenedetto, both of Ardsley, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

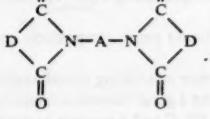
Division of Ser. No. 403,236, Oct. 3, 1973, Pat. No. 3,944,525. This application Jan. 26, 1976, Ser. No. 652,941

Int. Cl.[2] C08G *69/29*

U.S. Cl. 260—42.18 11 Claims

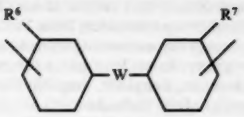
1. A glass fabric or fiber impregnated with a composition comprising

a. an unsaturated N,N'-bis-imide having the formula

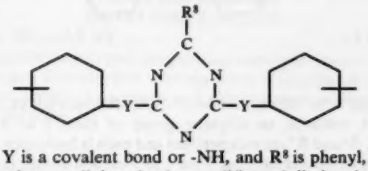


wherein

A is an alkylene group containing from 2 to 12 carbon atoms; cycloalkylene group containing from 4 to 6 carbon atoms, a xylylene group, an arylene group selected from phenylene, tolylene, biphenylene, naphthylene, a substituted arylene group of the formula

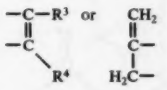


wherein W is sulfur, carbonyl, -NH, N-(lower)alkyl, -O-, -N-phenyl, sulfonyl, an alkylene group of from 1 to 3 carbon atoms, R^6 and R^7 are independent and each is hydrogen, chloro, or bromo, (lower)alkyl of from 1 to 5 carbon atoms, (lower)alkoxy containing from 1 to 5 carbon atoms, or a group having the formula



where Y is a covalent bond or -NH, and R^8 is phenyl, piperidino, hydrogen, diphenylamino or di(lower)alkyl amino;

D is a divalent radical containing olefinic unsaturation having the formula

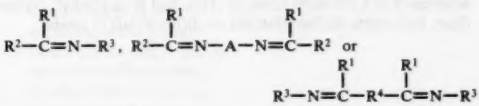


wherein

R^3 is hydrogen, methyl, bromo or chloro;

R^4 is hydrogen, methyl, bromo or chloro; and

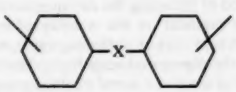
b. from about 0.5 to 0.166 mole equivalents per mole equivalent of (a) of a Schiff base having the formula



wherein

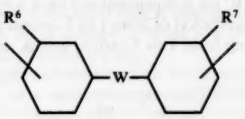
R^1 and R^2 independently is hydrogen, an alkyl group containing from 1 to 12 carbon atoms, an aryl group containing from 6 to 12 carbon atoms, an alkaryl group containing from 7 to 15 carbon atoms, an aralkyl group containing from 7 to 15 carbon atoms, chlorophenyl, alkoxyphenyl, said alkoxy containing from 1 to 5 carbon atoms, or together with the carbon to which they are attached from a monocyclic ring containing 5 to 6 carbon atoms, with the proviso that only one of R^1 or R^2 may be hydrogen at the same time; ; R^3 is an alkyl group containing from 1 to 12 carbon atoms, an aryl group containing from 6 to 12 carbon atoms, an alkaryl group containing from 7 to 15 carbon atoms, an aralkyl group containing from 7 to 15 carbon atoms, chlorophenyl, alkoxyphenyl, said alkoxy containing from 1 to 5 carbon atoms, cyclohexyl or cyclopentyl;

R^4 is an alkylene group containing from 2 to 12 carbon atoms, phenylene, tolylene, biphenylene, naphthylene, or an arylene group having the formula

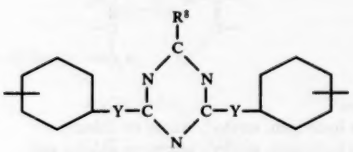


wherein X is, -S-, -O-, NH, N-phenyl, sulfonyl, or an alkylene group containing from 1 to 3 carbon atoms; and

A is an alkylene group containing from 2 to 12 carbon atoms; cycloalkylene group containing from 4 to 6 carbon atoms, a xylylene group, an arylene group selected from phenylene, tolylene, biphenylene, naphthylene, a substituted arylene group of the formula



wherein W is sulfur, carbonyl, -NH, -N(lower)alkyl, -O-, -N-phenyl, sulfonyl, an alkylene group of from 1 to 3 carbon atoms, R^6 and R^7 are independent and each is hydrogen, chloro, or bromo, (lower)alkyl of from 1 to 5 carbon atoms, (lower)alkoxy containing from 1 to 5 carbon atoms, or a group having the formula



wherein Y is a covalent bond or -NH, and R^8 is phenyl, piperidino, hydrogen, diphenylamino or di(lower)alkyl amino.

4,066,610

STABILIZED PIGMENTED POLYOLEFIN COMPOSITIONS

Kornel Dezso Kiss, Yonkers, N.Y.; John Leslie Hugh Allan, Glen Rock, and Marvin Michael Fein, Westfield, both of N.J., assignors to Dart Industries, Inc., Los Angeles, Calif.

Filed July 14, 1976, Ser. No. 705,233
Int. Cl.[2] C08K *5/22*
U.S. Cl. 260—42.21 **17 Claims**

1. The method of reducing the detrimental effect of a copper phthalocyanine pigment on the stability of a polyolefin resin pigmented with said copper phthalocyanine, which comprises: including in the pigmented resin from about 0.01 to about 10 percent of at least one metal chelating agent based on the weight of the polyolefin resin.

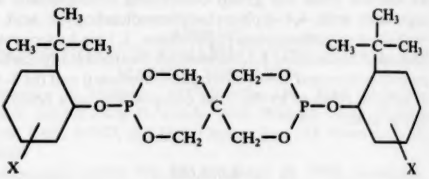
4,066,611

STABILIZED POLYCARBONATE COMPOSITION

Robert Jay Axelrod, Glenmont, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed June 23, 1976, Ser. No. 698,807
Int. Cl.[2] C08G *63/62*; C08K *5/52, 5/54*
U.S. Cl. 260—45.8 A **9 Claims**

1. A stabilized polycarbonate composition comprising in admixture, an aromatic carbonate polymer and a stabilizing amount of a cyclic diphosphite characterized by the following general formula:



wherein X is selected from the group consisting of lower alkyl of 1 to 6 carbon atoms; aryl, alkaryl and aralkyl of 6 to 20 carbon atoms and halogen.

4,066,612

Patent Not Issued For This Number

4,066,613

METHOD OF PREPARING HOMOGENEOUS THERMOSETTING POWDER PAINT COMPOSITIONS

Stephen Chung-Suen Peng, Rochester, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 389,845, Aug. 20, 1973, abandoned. This application Nov. 5, 1975, Ser. No. 629,160
Int. Cl.[2] C08J *3/14*
U.S. Cl. 260—42.54 **22 Claims**

1. A method of preparing a powder paint composition comprising:

A. passing a liquid paint composition comprising a solution of

1. a copolymer containing crosslinkable functional groups and having a glass transition temperature in the range of 40° C to 90° C and a number average molecular weight of between about 1,000 and about 15,000;
2. pigment; and
3. inert solvent through an evaporating zone comprising a tortuous path of relatively narrow cross-section, elongated in a direction lateral to the direction of flow of said solution through said zone;

B. heating said solution while it is confined within said evaporating zone to a temperature
1. above the melting point of said copolymer, but below the point at which degradation occurs;
2. above the temperature at which said inert solvent begins to vaporize

thus inducing turbulent flow of said solution within said evaporating zone and thereby maintaining an intimate homogeneous mixture of the vapors of the volatile components of said solution and dispersed particles of nonvolatile components of said solutios;

C. passing said homogeneous mixture from said evaporating zone into a separating zone and, while maintaining the temperature within said separating zone above the melting point of said copolymer, causing said solvent vapor to be removed and allowing said nonvolatile components to collect in a molten state;

D. removing said nonvolatile components from said separating zone;

E. cooling said nonvolatile components to form a solid material; and

F. pulverizing said solid material to form a uniformly pigmented powder.

4,066,614

HETEROCYCLICAMIDES OF HINDERED 3,5-DIALKYL-4-HYDROXYBENZOIC ACIDS AND USE AS LIGHT STABILIZERS IN POLYOLEFINS

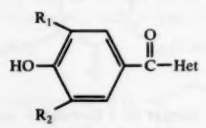
John Christian Oppelt, Somerville, and Peter Vincent Susi, Middlesex, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 30, 1974, Ser. No. 537,154

Int. Cl.[2] C07D *295/18;* **C08K** *5/34, 5/35, 5/47*

U.S. Cl. 260—45.8 NZ **10 Claims**

5. A polyolefin stabilized against the deteriorating effects of light by having incorporated therein an effective amount of a light stabilizer of the formula:



wherein R_1 and R_2 are each branch-chain alkyl of 3 to 8 carbon atoms and -Het is a nitrogen-containing heterocyclic moiety attached to the carbonyl carbon atom through a heterocyclic nitrogen.

4,066,615

POLYMER COMPOSITIONS CONTAINING PIPERIDINE DERIVATIVES AS STABILIZERS

Keisuke Murayama; Syoji Morimura; Takao Yoshioka; Toshimasa Toda; Eiko Mori; Hideo Horiuchi; Susumu Higashida; Katsuaki Matsui; Tomoyuki Kurumada; Noriyuki Ohta, and Hisayou Ohsawa, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Continuation of Ser. No. 414,281, Nov. 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 339,772, March 12, 1973, Pat. No. 3,941,744, which is a division of Ser. No. 258,392, May 31, 1972, abandoned. This application Apr. 11, 1975, Ser. No. 567,129

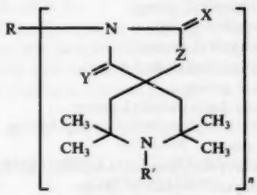
Claims priority, application Japan, June 5, 1971, 46-39630

The portion of the term of this patent subsequent to Mar. 2, 1993, has been disclaimed.

Int. Cl.[2] C08K *5/34, 5/35*

U.S. Cl. 260—45.8 NT **15 Claims**

1. A synthetic polymer composition stabilized against photo- and thermal deterioration wherein there is incorporated, in a sufficient amount to prevent said deterioration, a compound having the formula



(I)

wherein

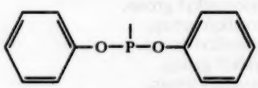
R′ represents
- an alkyl group of 1 to 20 carbon atoms,
- a hydroxyalkyl group,
- an alkenyl group having from 3 to 4 carbon atoms,
- a 2-propynyl group,
- a cyanoalkyl group,
- an alkoxyalkyl group,
- an alkenyloxyalkyl group,
- an aryloxyalkyl group,
- an alkylthioalkyl group,
- an epoxyalkyl group,
- an acyloxyalkyl group,
- an alkoxycarbonylalkyl group,
- an aralkyl group,
- 2-hydroxy-2-phenylethyl,
- a 2-acyloxy-2-phenylethyl group having 10 to 20 carbon atoms,
- an acyl group,
- an alkoxycarbonyl group,
- an aralkyloxycarbonyl group,
- an amino group,
- an acylamino group,
- an alkylamino group, or
- the nitroso group;

X represents
- an oxygen atom, or
- a sulfur atom;

Y represents
- an oxygen atom,
- a sulfur atom or
- a group of the formula =N—R″ in which
  - R″ is a hydrogen atom,
    - a methyl group,
    - an allyl group,
    - 2-propynyl group,
    - 2-hydroxyethyl group,
    - 2-methoxyethyl group, or
    - a benzyl group;

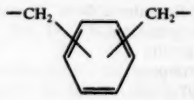
Z represents

an oxygen atom, or
a group of the formula =N-R''' in which
R''' is a hydrogen atom,
an alkyl group having 1 to 4 carbon atoms,
an allyl group,
2-propynyl group,
2-hydroxyethyl group,
an ethoxymethyl group,
2-vinyloxyethyl group,
2-phenoxyethyl group,
2-acetoxyethyl group,
2-benzyloxyethyl group, or
a benzyl group;
n is an integer of 1 through 4 inclusive; and
R represents when n is 1, an alkyl group of 1 to 20 carbon atoms,
a hydroxyalkyl group,
an alkenyl group having from 3 to 4 carbon atoms,
a 2-propynyl group,
a cyanoalkyl group,
an alkoxyalkyl group,
an alkenyloxyalkyl group,
an aryloxyalkyl group,
an alkylthioalkyl group,
an epoxyalkyl group,
an acyloxyalkyl group,
an alkoxycarbonylalkyl group,
an aralkyl group,
2-hydroxy-2-phenylethyl group,
a 2-acyloxy-2-phenylethyl group having 10 to 20 carbon atoms,
a 2,3-epoxypropyloxycarbonylalkyl group,
an aryloxycarbonylalkyl group,
an aryl group of 6 to 10 carbon atoms,
a halogen or alkyl substituted phenyl or naphthyl group,
a cycloalkyl group,
an alkoxycarbonyl group,
an aralkyloxycarbonyl group,
a dialkoxyphosphine group,
the diphenoxyphosphine group of the formula

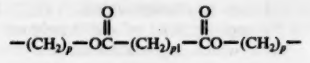


or a group of the formula

$(OR'''')_2$ in which R'''' is an alkyl group of from 1 to 8 carbon atoms, or a phenyl group;
when n is 2,a polymethylene group of 1 to 10 carbon atoms,
a group of the formula $-(CH_2)_p-CH=CH-(CH_2)_p-$ in which p is an integer of 1 through 8 inclusive and the p's may be the same or different,
an arylene group having 6 to 7 carbon atoms,
a xylylene group of the formula

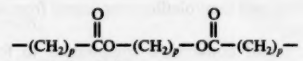


an alkylenediphenylene group having from 13 to 15 carbon atoms,
a bis-(alkoxycarbonyl)alkylene group of the formula

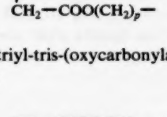


in which p is as defined above and p_1 is an integer of zero through 8 inclusive,
a group of the formula

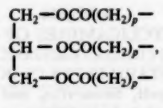
in which p is as defined above,
an alkylene-bis-(oxycarbonylalkyl)group of the formula



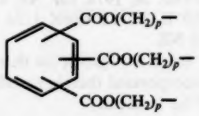
in which p is as defined above,
a dialkylene ether group or
a diphenylene ether group;
when n is 3, an alkanetriyl group,
a tris-(alkoxycarbonyl)-alkanetriyl group of the the formula



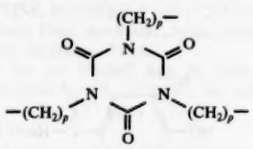
an alkanetriyl-tris-(oxycarbonylalkyl) group of the formula



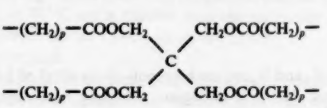
a group of the formula



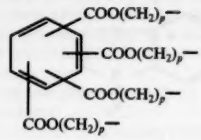
or a group of the formula



in which p is an integer of 1 through 8 inclusive and the p's may be the same or different, and when n is 4, an alkanetetrayl group, a tetrakis-(alkoxycarbonyl)alkanetetrayl group, an alkane-tetrayl-tetrakis(oxycarbonylalkyl)group of the formula



or a group of the formula



in which p = 1 to 8.

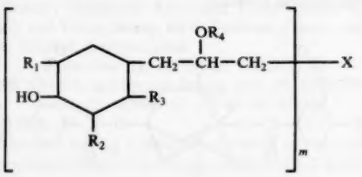
4,066,616

HYDROXYARYL HYDANTOINS AND THEIR USE AS STABILIZERS

Hanns Lind, Liestal, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

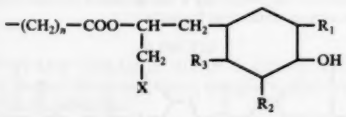
Division of Ser. No. 452,763, March 19, 1974, Pat. No. 3,956,298. This application Mar. 8, 1976, Ser. No. 664,451
Int. Cl.² C07D 233/78; C08K 5/34
U.S. Cl. 260—45.8 NT 10 Claims

1. A compound of the formula



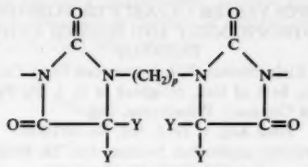
wherein m is an integer from 1 to 2 and R_1 denotes an alkyl group with 1 to 8 carbon atoms, a cycloalkyl group with 6 to 8 carbon atoms or an aralkyl group with 7 to 9 carbon atoms, R_2 denotes hydrogen, an alkyl group with 1 to 8 carbon atoms, cycloalkyl group with 6 to 8 carbon atoms or an aralkyl group with 7 to 9 carbon atoms, R_3 denotes hydrogen or a methyl group, R_4 denotes hydrogen or a

group, R_5, if m is 1 or 2, is an alkyl group with 1 to 17 carbon atoms, a cyclohexyl group, a phenyl group or phenyl substituted by halogen, hydroxyl groups, alkyl groups with 1 to 4 carbon atoms or alkoxy groups with 1 to 18 carbon atoms or an aralkyl group which can be substituted by alkyl and/or hydroxyl groups in the aromatic radical, and, if m is 1, is a group



X is selected from the group consisting of hydantoin, 5,5-dimethylhydantoin, and alkylene-bis-hydantoin, said hydantoin being bonded to the rest of the molecules via the nitrogen in position 3, and n denotes an integer from 2 to 8.

5. A compound of claim 1, wherein m is 2, R_1 and R_2 each is a tertiary butyl group, R_3 and R_4 are hydrogen, X is a group



where

Y is an alkyl group with 1 to 4 carbon atoms and p is an integer from 1 to 8.

4,066,617

STABILIZED POLY(ALKYLENE TEREPHTHALATES)

Herbert L. Rawlings, and Arthur L. Baron, both of New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 642,841, Dec. 22, 1975, abandoned. This application Aug. 23, 1976, Ser. No. 716,601
Int. Cl.² C08K 5/15
U.S. Cl. 260—45.8 A 14 Claims

1. A stabilized polymeric molding material comprising:

a poly(alkylene terephthalate); and,

a stabilizing amount of a neutral ester of phosphorous acid with at least one oxetane group.

4,066,618

FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 28, 1973, Ser. No. 429,644
Int. Cl.² C08K 5/09
U.S. Cl. 260—45.85 T 7 Claims

1. A flame retardant aromatic carbonate polymer composition comprising in admixture an aromatic carbonate polymer and a flame retardant amount of an additive which is the metal salt of a halogenated non-aromatic carboxylic acid, wherein the metal salt is selected from the group consisting of alkali metals and alkali earth metals, and mixtures thereof, and the halogen is selected from the group consisting of bromine and chlorine and mixtures thereof, and fluorine, provided, however, that when fluorine is used, the carboxylic acid is a dicarboxylic acid.

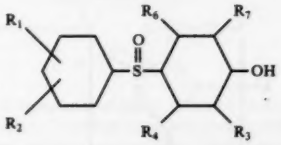
4,066,619

4-HYDROXYDIPHENYL SULFOXIDE COMPOSITIONS

Dwight William Chasar, Northfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 2, 1976, Ser. No. 737,953
Int. Cl.² C08K 5/41
U.S. Cl. 260—45.95 C 10 Claims

1. A polyolefin containing a stabilizing amount of a 4-hydroxydiphenyl sulfoxide of the formula



wherein R_1 is hydrogen, R_2 is a lower alkyl or halogen, wherein R_3 is hydrogen or a lower alkyl from one to 6 carbon atoms, R_4 is hydrogen or lower alkyl, R_6 is hydrogen, lower alkyl or alkoxy containing from 1 to 6 carbon atoms and R_7 is hydrogen or lower alkyl from 1 to 6 carbon atoms.

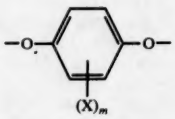
4,066,620
COPOLYESTER CAPABLE OF FORMING ANISOTROPIC MELT AND SHAPED ARTICLES THEREOF

Jacob John Kleinschuster, Wilmington, and Terry Carl Pletcher, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

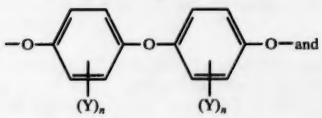
Filed Aug. 1, 1975, Ser. No. 601,074
Claims priority, application Sweden, Apr. 29, 1975, 7504996
Int. Cl.² C08G 63/18, 63/66
U.S. Cl. 260—47 C 13 Claims

1. A fiber-forming melt-spinnable copolyester capable of forming an anisotropic melt consisting essentially of units of the formula:

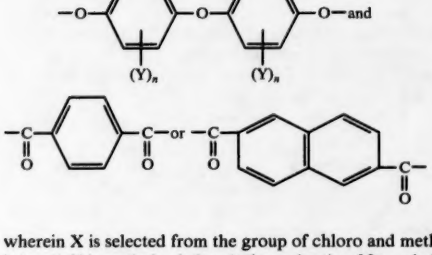
I



II



III



wherein X is selected from the group of chloro and methyl; *m* is 1 or 2; Y is methyl; *n* is 0 or 1; the mol ratio of formula I units to formula II units is within the range of from about 85/15 to 60/40.

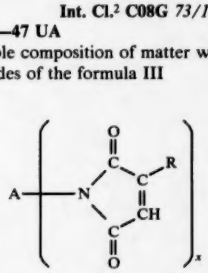
4,066,621
CURABLE MIXTURES BASED ON POLYIMIDES OF UNSATURATED DICARBOXYLIC ACIDS AND INDOLE COMPOUNDS

Albrecht Müller, Darmstadt, Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 2, 1975, Ser. No. 618,994
Claims priority, application Switzerland, Oct. 10, 1974, 13625/74
Int. Cl.² C08G 73/12
U.S. Cl. 260—47 UA 10 Claims

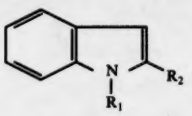
1. A curable composition of matter which comprises
a. polyimides of the formula III

(III)



in which A denotes a *x*-valent organic radical with 2 to 30 carbon atoms, R denotes hydrogen or methyl, and *x* denotes the number 2 or 3;
b. indole or indole derivatives of the general formula II

(II)



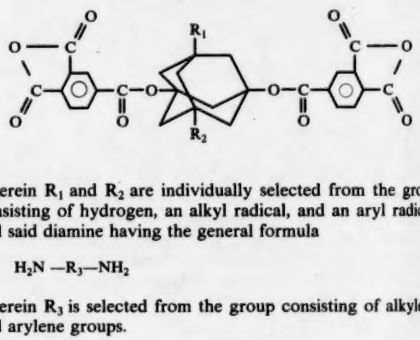
in which R_1 denotes hydrogen, alkyl with 1 to 4 carbon atoms or acyl with 2 to 5 carbon atoms, and R_2 denotes hydrogen or alkyl with 1 to 4 carbon atoms; and the ratio of components (a) and (b) being chosen to provide 0.005 to 1.0 mol of indole derivative (b) of formula II per each 1 equivalent of imide group in component (a).

4,066,622
POLYAMIDE ACIDS AND POLYESTERIMIDES FROM 1,3-ADAMANTYLENE-BIS-TRIMELLITATE DIANHYDRIDES

Allen Feinstein, Wheaton, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Division of Ser. No. 597,339, July 21, 1975, Pat. No. 3,976,665.
This application Feb. 12, 1976, Ser. No. 657,442
Int. Cl.² C08G 73/16
U.S. Cl. 260—47 CP 8 Claims

1. As a composition of matter, a polyamide acid formed by reacting about equimolar amounts of a dianhydride with a diamine at a temperature below 500° F., said dianhydride having the general formula



wherein R_1 and R_2 are individually selected from the group consisting of hydrogen, an alkyl radical, and an aryl radical, and said diamine having the general formula

$$H_2N-R_3-NH_2$$

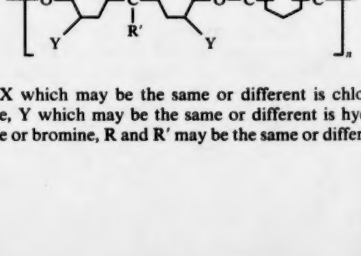
wherein R_3 is selected from the group consisting of alkylene and arylene groups.

4,066,623
INVERSE INTERFACIAL POLYMERIZATION FOR PREPARING CERTAIN HALOGENATED AROMATIC POLYESTERS

Michael M. Besso, West Orange, and Lowell Saferstein, Edison, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,648
Int. Cl.² C08G 63/18, 63/24, 63/68
U.S. Cl. 260—47 C 23 Claims

1. A process for preparing a halogenated aromatic polyester of the recurring structural formula



where X which may be the same or different is chlorine or bromine, Y which may be the same or different is hydrogen, chlorine or bromine, R and R′ may be the same or different and

represent lower alkyl groups, hydrogen, or together constitute a cyclic hydrocarbon group, and *n* equals at least 13, by the inverse interfacial polymerization of a halogenated bisphenol and isophthaloyl chloride, terephthaloyl chloride or mixtures thereof which comprises:

I. providing an organic phase comprising
  a. an organic solvent,
  b. a phthaloyl chloride or mixtures thereof, and
  c. a catalytic amount of a phase transfer catalyst;
II. providing an aqueous phase comprising
  a. an aqueous solvent immiscible with said organic solvent and capable of dissolving an alkali salt of said halogenated bisphenol,
  b. an alkali salt of said halogenated bisphenol, and
  c. a base in amounts sufficient to provide a pH of at least 8 in said aqueous solution,
III. adding the aqueous phase to the organic phase over a period of time of not less than about 20% of the total polymerization time and in a manner sufficient to sustain the uniform availability of phase transfer catalyst for reaction with the alkali salt of the bisphenol during the polymerization reaction thereby providing a polyester having a low molecular weight fraction of not greater than about 3% by weight of the polyester;
IV. recovering the resulting polyester product.

4,066,624

POLYESTERS OF NAPHTHALENE CARBOXYLIC ACIDS AND HYDROXY ALKOXYDIPHENYL SULFONES

Shoji Kawase; Takatoshi Kuratsuji; Hiroo Inata; Kazuyoshi Suzuki, and Takeo Shima, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

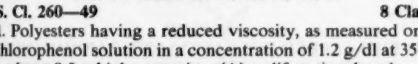
Filed Jan. 21, 1975, Ser. No. 542,793

Claims priority, application Japan, Jan. 25, 1974, 49-10078

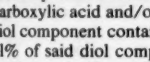
Int. Cl.[2] C08G *63/18, 63/66, 63/68*

U.S. Cl. 260—49 **8 Claims**

1. Polyesters having a reduced viscosity, as measured on an o-chlorophenol solution in a concentration of 1.2 g/dl at 35° C. of at least 0.5 which comprises (A) a difunctional carboxylic acid component containing at least 50 mol% of a naphthalene dicarboxylic acid and/or its lower alkyl ester or aryl ester, (B) a diol component containing an aromatic group and at least 50 mol% of said diol component being a 4,4'-bis-(ω-hydroxyalkoxy)diphenylsulfone of the general formula



wherein *n* is an integer of 2 to 6, and (C) is a diol component of the general formula



wherein R is an aliphatic or alicyclic hydrocarbon group containing 2 to 12 carbon atoms,

said polyester obtained by heat polymerizing, while distilling off the excessive of the component (C) out of the reaction system at a molar ratio of component (B) to component (A) of 0.05–1:1 and a molar ratio of the sum of components (B) and (C) to component (A) of 1.1–3.0:1.

4,066,625

UNITARY CURABLE RESIN COMPOSITIONS

Justin C. Bolger, Needham, Mass., assignor to Amicon Corporation, Lexington, Mass.

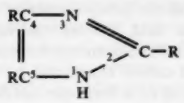
Continuation-in-part of Ser. No. 635,394, May 2, 1967, abandoned, and a continuation-in-part of Ser. No. 736,605, June 13, 1968, abandoned, and a continuation of Ser. No. 53,304, July 8, 1970, abandoned. This application Jan. 24, 1973, Ser. No. 326,560

Int. Cl.[2] C08G *2/30*

U.S. Cl. 260—59 R **31 Claims**

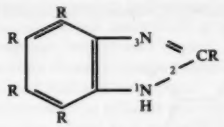
1. A curing agent suitable for use with epoxy resin systems comprising the solid thermoplastic reaction product of an epoxy resin containing a plurality of oxirane groups and an imidazole compound selected from

(a)



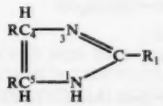
wherein R is hydrogen, alkyl, alkenyl, aryl, or halo;

(b)



wherein R is defined as above;

(c)



wherein R is defined as above and R_1 is alkyl, alkenyl, aryl, or halo; and

d. mixtures of such compounds, the ratio of oxirane groups in the epoxy resin to the molecules of imidazole compound being between 1:1 and 2:1, said reaction product having a melting point from about 70° C. to about 140° C.

4,066,626

LINEAR POLYESTERS BASED ON HETEROCYCLIC DICARBOXYLIC ACIDS

Hans Herzog, Badenweiler; Lothar Buxbaum; Thomas Kainmuller, both of Lindenfels, Odenwald, all of Germany, and Jürgen Habermeier, Pfeffingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 20, 1976, Ser. No. 678,573

Claims priority, application Switzerland, Apr. 23, 1975, 5203/75; Feb. 12, 1976, 1707/76

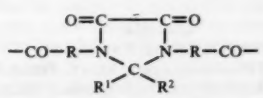
Int. Cl.[2] C08G *63/68*

U.S. Cl. 260—75 N **12 Claims**

1. A linear thermoplastic polyester with a relative viscosity of 1.2 to 3, measured at 30° C in a 1% solution in a solvent consisting of equal parts of phenol and tetrachloroethane, and having a structural formula consisting of 50 molar percent of radicals derived from the dicarboxylic acids of components (a) plus (b) and 50 molar percent of radicals derived from the diols of component (c), which consists essentially of

a. 5 to 50 molar percent of dicarboxylic acid radicals of formula I

(I)



wherein R represents alkylene of 1 to 2 carbon atoms;

alkylene of 1 to 2 carbon atoms substituted with alkyl of 1 to 6 carbon atoms; cyclohexylene, phenylene or benzylene, the methylene group of which is attached to the nitrogen atom; and

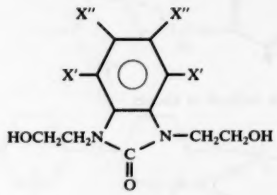
each of R^1 and R^2 represents hydrogen, alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 5 ring members or phenyl; or

R^1 and R^2 together represent $—(CH_2)_n—$, in which *n* is 4, 5,

6 or 7, and if R is phenylene, R^1 represents hydrogen and R^2 represents alkyl of 1 to 18 carbon atoms or cycloalkyl of 5 to 8 ring members;

b. 0 to 45 molar percent of dicarboxylic acid radicals derived from the acids selected from the group consisting of terephthalic acid, isophthalic acid, 2,6-naphthalenedicarboxylic acid, 4,4'-diphenylsulfone-dicarboxylic acid and alkanedioic acids of 6 to 12 carbon atoms; and

c. 50 molar percent diol radicals of at least one diol derived from the diols selected from the group consisting of the alkylene diols of 2 to 10 carbon atoms; 1,4-cyclohexanediol, 1,4-bis-(hydroxymethyl)cyclohexane, 1,1'-methylene-bis [3-(2-hydroxyethyl)-5,5-dimethylhydantoin] and a diol of the formula II



wherein X' and X'' represent hydrogen, chlorine or bromine, or X' represents hydrogen and X'' represents chlorine or bromine.

4,066,627

PRODUCTION OF POLYESTERS

Willem F. H. Borman, and Eugene P. Reilly, both of Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 336,704, Feb. 28, 1973, abandoned. This application July 22, 1976, Ser. No. 707,708

Int. Cl.[2] C08G *63/18, 63/34*

U.S. Cl. 260—75 M **7 Claims**

1. A process for the preparation of a linear poly(1,4-butylene terephthalate) resin, said process comprising:

a. heating at a temperature in the range of from about 150° to about 300° C. a reaction mixture comprising an excess of 1,4-butanediol, dimethyl terephthalate and terephthalic acid, the proportions of the reactants satisfying the following equation:

$$\frac{\text{No. of moles of 1,4-butanediol}}{\text{No. of moles of TA}} = 1.25 \text{ to } 2.0$$

$$(95 - 75 \text{ mole \% DTA} + 5 - 25 \text{ mole \% TPA})$$

wherein TA is the terephthalate mixture, DAT is dimethyl terephthalate and TAP is terephthalic acid; and

b. removing the excess 1,4-butanediol and methanol and water byproducts until a high molecular weight resin is formed.

4,066,628

OXAZOLIDONE CATALYST

Kaneyoshi Ashida, Hiratsuka, Japan; Kurt C. Frisch, Grosseille, and Panagiotis Kordomenos, Detroit, both of Mich., assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Aug. 2, 1976, Ser. No. 710,607

Int. Cl.[2] C08G *59/14*

U.S. Cl. 260—77.5 R **7 Claims**

1. A process for preparing oxazolidones which comprises reacting an organic isocyanate with an epoxide in the presence of from 0.001 to 5 weight percent, based on the reactants, of a catalyst selected from the group consisting of ZnR_2, $Zn(OCOR)_2$, ZnX and AlR_3 wherein R is an alkyl group having 1 to 12 carbon atoms and X is an organic bidentate group.

4,066,629

PROCESS FOR PREPARING CARBODIIMIDES UTILIZING A PHOSPHONIUM SALT CATALYST

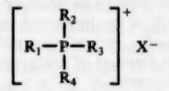
Robert Edelman, Staten Island, N.Y., assignor to Celanese Corporation, New York, N.Y.

Filed Oct. 28, 1976, Ser. No. 736,641

Int. Cl.[2] C08G *18/16*; C07C *119/055*; C08G *18/14*

U.S. Cl. 260—77.5 R **14 Claims**

1. A process for preparing organic carbodiimides from organic isocyanates having no active hydrogen containing substituents which are reactive with the isocyanate group which comprises heating said organic isocyanates, under anhydrous conditions and at a reaction temperature of about 155° to about 215° C, together with about 0.1 to about 10 mole percent based on isocyanate concentration of a phosphonium salt catalyst having a boiling point above the reaction temperature utilized and having the formula:



wherein R_1, R_2, R_3 and R_4 may be the same or different and represent alkyl groups of 1 to 8 carbon atoms, cycloalkyl, aryl, aralkyl, and alkaryl and their derivatives or two of said groups together may constitute a cyclic hydrocarbon, and X represents a halogen.

4,066,630

END CAPPED POLYALKYLENE CARBONATES HAVING IMPROVED THERMAL STABILITY

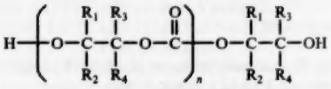
Dale D. Dixon, Kutztown; Michael E. Ford, Center Valley, and Gerald J. Mantell, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 10, 1977, Ser. No. 757,909

Int. Cl.[2] C08G *63/62*

U.S. Cl. 260—77.5 D **15 Claims**

1. A process for improving the thermal stability of a normally solid polycarbonate having substantially alternating epoxide and carbon dioxide units and having a plurality of free hydroxyl groups represented by the formula:



wherein:

R_1 is hydrogen, a halomethyl group, or a hydrocarbyl group having from 1 to 6 carbon atoms;

R_3 is hydrogen, a halomethyl group, or a hydrocarbyl group having from 1 to 6 carbon atoms;

R_2 and R_4 are hydrogen or a hydrocarbyl group having from 1 to 6 carbon atoms;

R_1, R_2, R_3 and R_4 are combined together constituting a carboxylic ring of from 4 to 7 carbon atoms; and

n is a number from about 250–6,500;

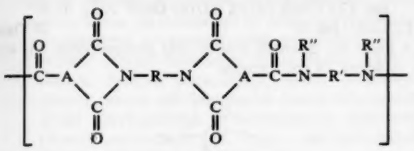
which comprises end-capping at least a portion of the free hydroxyl groups of said polycarbonate by reacting said hydroxyl groups with a hydroxyl reactive organic compound having the ability to replace the active hydrogen atom on said hydroxyl group for forming an oxygen-carbon bond, said reaction being carried out under conditions sufficient for effecting said reaction.

4,066,631
PROCESS FOR PREPARATION OF LINEAR POLYAMIDE-IMIDES FROM AROMATIC TRICARBOXYLIC ACID ANHYDRIDES AND DIAMINES

Daniel Ashton Dimmig, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed May 19, 1975, Ser. No. 578,711
Int. Cl.[2] C08G 73/14
U.S. Cl. 260—78 R 5 Claims

1. A process for preparing a linear polyamideimide consisting essentially of recurring units having the formula



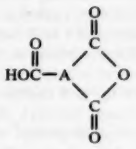
in which

A is an aromatic radical;

R and R′ are araliphatic, aliphatic or cycloaliphatic radicals in which the carbon atoms attached to N are aliphatic carbon atoms;

R″ is H, or an araliphatic, aliphatic or cycloaliphatic radical; or both R″ radicals together form a divalent aliphatic radical; comprising the steps of

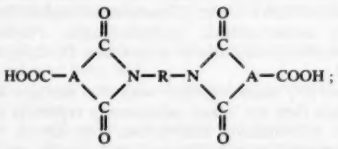
1. reacting an aromatic tricarboxylic acid anhydride having the formula



with a diamine of the formula

$H_2N—R—NH_2$

to form a diacid imide of the formula



forming the corresponding acid halide derivative by converting the carboxyl groups in the diacid imide to halocarbonyl groups; and then polycondensing said acid halide derivative of the imide with an amine of the formula

HR″N—R′—N—R″H.

4,066,632
CONTINUOUS REACTION FOR PREPARATION OF ARYLENE SULFIDE POLYMER

Kenneth L. Anderson, Bartlesville, Okla., and Donald G. Kuper, Borger, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 30, 1976, Ser. No. 671,776
Int. Cl.[2] C08G 75/16
U.S. Cl. 260—79.1 7 Claims

1. A continuous process using a plurality of reaction vessels connected in series for producing arylene sulfide polymer by contacting a dihalo aromatic compound with a sulfur source in an organic amide to produce a particulate polymeric product, said method comprising:

a. introducing the reactant compounds into a first reaction vessel maintained at polymerization conditions of temperature and pressure sufficient to remove water and organic amide from the reaction by evaporation thereby producing a reaction mixture;

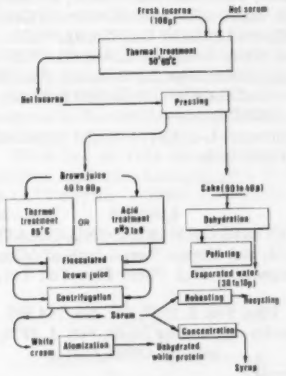
b. introducing effluent reaction mixture from the first reaction vessel to a second reaction vessel maintained at a pressure about 2 Kg/cm² below the pressure of the first reactor that flow of reactants is induced from said first reaction vessel to said second reaction vessel, said second reaction vessel maintained at a temperature sufficient to evaporate water and organic amide from the reaction mixture thereby concentrating the reaction mixture in the second reaction vessel; and

c. subjecting the effluent reaction mixture from the second reaction vessel to a reduced pressure sufficient to flash evaporate the liquid portion to recover a particulate, polymeric product and a condensible vapor.

4,066,633
PROCESS FOR THE TREATMENT OF GREEN, LEAFY PLANTS FOR THE EXTRACTION OF PROTEINS IN THE PRESSING JUICES AND FOR ECONOMICAL DEHYDRATION OF CAKE

Charles Gastineau, Chalons-sur-Marne; Olivier de Mathan, Olivet, and Jan-Dominique Dilly, Chalons-sur-Marne, all of France, assignors to France Luzerne, Paris, France

Filed Nov. 3, 1975, Ser. No. 628,369
Int. Cl.[2] A23J 1/14
U.S. Cl. 260—112 R 39 Claims



1. In a process for treating green vegetable matter comprising the steps of:

a. preliminary treatment of the crude vegetable matter,

b. pressing the matter obtained in said step (a), thus providing a cake and a brown colored pressing juice,

c. dehydration of the cake obtained in said step (b), the improvement being that said treatment (a) is effected under conditions capable of producing flocculation of the chloroplastic proteins within the vegetable tissues, said conditions being selected from the group consisting of (i) treating said vegetable matter at a moderately high temperature at a pH of 4.5 to 8.5, (ii) treating said vegetable matter at a pH higher than 10, and (iii) treating said vegetable matter at a moderately high temperature and at a pH of approximately 12, said vegetable matter thereby retaining within its cells the greater portion of the chloroplastic proteins and pigments, while the pressing juice entrains a maximum amount of non-pigmented cytoplasmic proteins,

and that said brown colored pressing juice obtained from said step (b) is subjected to an acid or thermal treatment (d) capable of inducing flocculation of the cytoplasmic proteins and removal of the entrained pigments, and after said step (d), there is effected a separation (e) of the precipitated cytoplasmic proteins of said step (d) and a liquid serum; and further said treatment (a) is effected in a liquid medium, selected from the group consisting of water and said liquid serum recovered from said step (e), the ratio of the weight of said liquid medium to said crude vegetable matter being between 1:1 and 10:1.

4,066,634

PURIFICATION OF SYNTHETIC SOMATOSTATIN

William H. McGregor, Malvern, and Joseph J. Dougherty, Drexel Hill, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Aug. 31, 1976, Ser. No. 719,304
Int. Cl.[2] C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 S **2 Claims**

1. A process for producing chromatographically pure somatostatin which comprises

a. passing an aqueous solution of impure, synthetically produced somatostatin through a weakly acidic ion exchange resin containing ammonium carboxylate functional groups, with an ammonium hydroxide-ammonium acetate eluant in a volume/volume ratio of 1 to 9 : 1 and

b. collecting the somatostatin containing fraction of eluate.

4,066,635

L-PYROGLUTAMYL-L-HISTIDYL-L-PROLYL-BETA-ALANINAMIDE AND SALTS

Dieter Gillessen, Birsfelden; Rolf Studer, Bottmingen, both of Switzerland, and Arnold Trzeciak, Lorrach, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 603,405, Aug. 11, 1975, abandoned. This application Sept. 20, 1976, Ser. No. 724,796
Int. Cl.[2] C07C *103/52;* H61K *37/00*
U.S. Cl. 260—112.5 R **6 Claims**

1. L-Pyroglutamyl-L-histidyl-L-prolyl-beta-alaninamide and acid addition salts thereof.

4,066,636

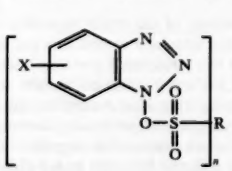
METHOD OF HARDENING GELATIN

Hidefumi Sera, and Kameji Nagao, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 1, 1977, Ser. No. 764,507
Claims priority, application Japan, Feb. 2, 1976, 51-10541
Int. Cl.[2] C09H *7/00*
U.S. Cl. 260—117 **7 Claims**

1. A method of hardening gelatin which comprises treating gelatin with a compound represented by the formula (I):

(I)



wherein X represents a hydrogen atom, an alkyl group having 6 or less carbon atoms, an aryl group having 6 to 8 carbon atoms, a haloalkyl group having 1 to 2 carbon atoms, an alkoxy group having 10 or less carbon atoms, a halogen atom, a carboxy group, a sulfo group, a salt of a carboxy group or a sulfo group, an alkyl ester having 4 or less carbon atoms in the alkyl moiety or an amide of said carboxy and sulfo group, an acylamino group or a nitro group, *n* represents 1 or 2, and R represents a monovalent or divalent organic group.

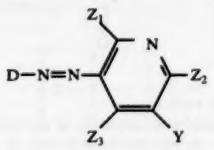
4,066,637

BASIC DIAMINOPYRIDINE-(3)-AZO DYESTUFFS

Visvanathan Ramanthan, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 480,457, June 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 316,803, Dec 20, 1972, abandoned. This application Aug. 18, 1975, Ser. No. 605,786
Int. Cl.[2] C09B *29/36, 45/00;* D06P *3/52, 3/76*
U.S. Cl. 260—146 R **25 Claims**

1. A basic azo dyestuff, free of acid groups conferring solubility in water, of the formula



wherein

Y is —CN or —$CONH_2$,

two of Z_1, Z_2 and Z_3 represent -NR′R″ and the third represents -NR′R″, -OR‴ or -SR‴, where R′, R″ and R‴ independently represent hydrogen,

alkyl of up to 12 carbon atoms, which is unsubstituted or substituted by: hydroxy, carboxy, carbalkoxy of 2 to 6 carbon atoms, alkoxy of 1 to 8 carbon atoms, phenoxy, acyloxy or acylamino wherein acyl is alkanoyl of up to 5 carbon atoms, alkylcarbamyl of up to 5 carbon atoms, alkoxycarbonyl of up to 5 carbon atoms, phenylcarbamyl, phenoxycarbonyl, benzoyl, phenoxyacetyl, chloracetyl or phenylacetyl; or phenyl which is unsubstituted or substituted by halo, lower alkyl, lower alkoxy, β-hydroxyethyl or lower carboalkoxy;

phenyl which is unsubstituted or substituted by chloro, bromo, fluoro, alkyl of 1 to 6 carbon atoms which is unsubstituted or substituted by bromo, chloro, lower alkoxy, cyano or lower alkoxycarbonyl; lower alkoxycarbonyl, trifluoromethyl, acetyl, aminocarbonyloxy, aminosulfonyl, lower alkylaminosulfonyl, di(lower alkyl) aminosulfonyl, methylsulfonyl, ethylsulfonyl, methylthio, ethylthio or phenylthio; C_5–C_9 cycloalkyl; and

R′ and R″, taken together with the nitrogen atom to which they are linked, additionally represent piperidinyl, pyrollidinyl, morpholino, piperazinyl, methylpiperazinyl, acetylpiperazinyl or 3-picolyl;

D is phenyl;

phenyl substituted by chloro, bromo, fluoro, hydroxy, cyano, thiocyano, nitro, lower alkyl, trifluoromethyl, lower alkoxy, lower alkylmercapto, formyl, loweralkylcarbonyl, benzoyl, methylbenzoyl, lower alkoxycarbonyl, lower alkoxycarbonyloxy, benzyloxycarbonyloxy, cyclohexylcarbonyl, phenoxycarbonyl, benzoyloxy, lower alkylcarbonylamino, benzoylamino, loweralkylsulphonyl, chloroethylsulphonyl, hydroxyethylsulphonyl, aminosulphonyl, N-(lower alkyl) aminosulphonyl, N,N-(diloweralkyl) aminosulphonyl, di(β-hydroxyethyl) aminosulphonyl, phenylaminosulphonyl, (chloro-or methoxy-) phenylaminosulphonyl, benzylaminosulphonyl, N-piperidylsulphonyl, N-morpholinosulphonyl, lower alkylsulphonyloxy, cyclohexylsulphonyloxy, chloromethylsulphonyloxy, cyanoethylsulphonyloxy, phenylsulphonyloxy, aminosulphonyloxy, (chloro- or methoxy-) phenylsulphonyloxy, N-morpholinosulphonyloxy, ethyleneiminosulphonyloxy, lower monoalkylaminosulphonyloxy, phenylaminosulphonyloxy, N-phenyl-N(lower alkyl)

aminosulphonyloxy, N-(methoxy- or chloro-) phenylaminosulphonyloxy, phenylamino, nitrophenylamino, dinitrophenylamino, phenyl, phenoxy or acetylphenyl; phenylazophenyl;

phenylazophenyl substituted by chloro, bromo, hydroxy, cyano, nitro, lower alkyl, trifluoromethyl, lower alkoxy or phenoxy; napthyl;

napthyl substituted by methoxy, ethoxy, phenylazo or dimethylaminosulphonyl; or

D is a nitrogen heterocyclic group selected from thiazolyl or thiazolyl substituted by chloro, bromo, cyano, thiocyano, lower alkyl, lower alkoxy, lower alkylmercapto, phenyl, benzyl, phenethyl, lower alkoxycarbonyl, trifluoromethyl, lower alkylcarbonyl or lower alkylsulphonyl;

benzythiazolyl or benzthiazolyl substituted by chloro, bromo, cyano, thiocyano, nitro, lower alkyl, lower alkoxy, benzyl, phenylethyl, lower alkylsulphonyl, phenyl, lower alkylmercapto, lower alkoxycarbonyl, lower alkylcarbonyl, trifluoromethyl, cyanoethylsulphonyl, aminosulphonyl, lower alkylaminosulphonyl, di(lower alkyl) aminosulphonyl;

pyrazolyl or pyrazolyl substituted by cyano, lower alkyl, lower alkoxy, lower alkoxycarbonyl or phenyl; thiadizolyl or thiadiazolyl substituted by lower alkoxy, lower alkyl, phenyl, lower alkylsulphonyl or lower alkylmercapto;

imidazolyl or imidazolyl substituted by nitro or lower alkyl;

isothiazolyl or isothiazolyl substituted by lower alkyl, nitro, lower alkylsulphonyl, lower alkoxycarbonyl, cyano or phenyl;

benzisothiazolyl or benzisothiazolyl substituted by lower alkyl, nitro or halo; benzimidazolyl or benzimidazolyl substituted by lower alkyl, nitro or halo;

napthiazolyl or napthiazolyl substituted by lower alkyl, nitro or halo;

quinolinyl or quinolyl substituted by lower alkyl, nitro or halo;

benzoxazolyl or benzoxazolyl substituted by lower alkyl, nitro or halo;

pyridinyl or pyridinyl substituted by lower alkyl, nitro or halo;

indazolyl or indazolyl substituted by lower alkyl, nitro or halo;

selenazolyl or selenazolyl substituted by lower alkyl, nitro or halo;

oxazolyl or oxazolyl substituted by lower alkyl, nitro or halo;

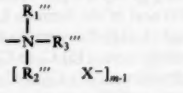
oxadiazolyl or oxadiazolyl substituted by lower alkyl, nitro or halo; and

triazolyl or triazolyl substituted by lower alkyl, nitro or halo; or

D is thienyl or thienyl substituted by nitro, lower alkyl, lower alkylsulphonyl, lower alkoxycarbonyl or acetyl;

with the proviso that either

a. one of Z_1, Z_2, Z_3 or D is further substituted either by a direct bond or via an alkylene, alkyleneoxy, alkylenecarbonyl, carbonyloxy, carbonylamino, alkylenecarbonyloxy, alkylenecarbonylamino, alkylenesulphonylamino or alkylenesulphonyl group by



i)

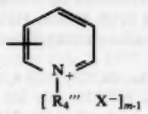
wherein

R_1''' and R_2''' independently represent lower alkyl, benzyl, phenethyl, β-hydroxyethyl, β-carbethoxyethyl or cyclohexyl,

R_3''' is lower alkyl, benzyl, cyclohexyl, lower alkoxy or $-NH_2$

and two of R_1''', R_2''' and R_3''' can further represent, together with the nitrogen to which they are attached, piperidino, methylpiperdino, pyrrolidino, morpholino, piperazinyl or imidazolyl,

X is an anion and m is 1 or 2; or by



ii)

wherein

R_4''' is alkyl of 1–4 carbon atoms, cyclohexyl or benzyl,

X is an anion and m is 1 or 2; or

b. when D is said nitrogen heterocyclic group, D is in the form of its N-(lower alkyl or benzyl) quaternary ammonium salt thereof.

4,066,638

WATER-SOLUBLE FIBER REACTIVE PHENYL-AZO-NAPHTHYL DYESTUFFS CONTAINING TWO SULFO GROUPS IN THE PHENYL MOIETY

Hermann Fuchs, Kelkheim, Taunus; Gustav Kapaun, Neuenhain, Taunus, and Fritz Meininger, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

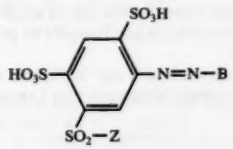
Filed Oct. 15, 1974, Ser. No. 514,994

Claims priority, application Germany, Oct. 17, 1973, 2351970

Int. Cl.[2] C09B *62/74;* D06P *1/384, 3/10, 3/66*

U.S. Cl. 260—196 **6 Claims**

1. A compound which, in the form of the free acid, corresponds to the formula



in which Z is

$-CH_2-CH_2-A$

or

$-CH=CH_2$

in which A is Cl, Br, OSO_3H, SSO_3H, OPO_3H_2, O-$COCH_3$ or SO_2-CH_3, B is naphthol, naphthylamine or aminonaphthol, unsubstituted or substituted on the aromatic moieties by one to four groups selected from alkyl, alkoxy, oxalkyl, cyanoalkyl, aminoalkyl or alkoxyalkyl, each alkyl and alkoxy moiety having 1 to 6 carbon atoms, or with chlorine, bromine, sulfonic acid, vinylsulfonyl, carboxyl, acylamino or arylamino groups.

4,066,639
BENZENE-SULFONYL SEMICARBAZIDES AND PROCESS FOR PREPARING THEM

Helmut Weber, Frankfurt am Main; Karl Muth, Kelkheim, Taunus; Rudi Weyer, Frankfurt am Main; Walter Aumuller, Kelkheim, Taunus, and Erich Haack, Heidelberg, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 69,523, July 6, 1970, which is a continuation of Ser. No. 567,833, July 26, 1966, abandoned, which is a continuation-in-part of Ser. No. 542,723, May 6, 1965.
This application Jan. 24, 1975, Ser. No. 544,018
Claims priority, application Germany, May 6, 1965, 45971
Int. Cl.[2] A61K *31/64;* C07D *211/98, 227/12, 295/22*
U.S. Cl. 260—239 BF 5 Claims

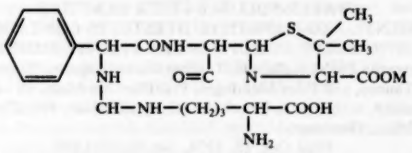
1. The compound 4-[4-(β-{2-methoxy-5-chloro-benzamido}-ethyl)-benzene-sulfonyl]-1,1-(γ,γ-dimethyl-pentamethylene)-semicarbazide or its physiologically tolerable salt.

4,066,640
METHAMPICILLIN LYSINATE AND ITS METHOD OF MANUFACTURE

Young Sul Kim, 302-62, Yichon-dong, Yong San, Seoul, South Korea

Division of Ser. No. 709,644, July 29, 1976, Pat. No. 4,031,076.
This application Jan. 26, 1977, Ser. No. 762,663
Claims priority, application South Korea, July 31, 1975, 1686/75
Int. Cl.[2] C07D *499/44*
U.S. Cl. 260—239.1 1 Claim

1. A process for preparing Methampicillin Lysinate having the formula:



wherein M is selected from the group consisting of hydrogen, sodium, potassium, calcium and aluminum, which comprises the steps of:

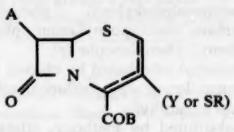
a. solubilizing ampicillin by converting ampicillin to a water saluble salt;
b. reacting said water soluble salt of ampicillin with a solution of formaldehyde and formalin to produce methylene ampicillin;
c. reacting L-Lysine with said methylene ampicillin in acid solution to obtain Methampicillin Lysinate.

4,066,641
METHOD FOR CYCLIZATION TO GIVE CEPHEM RING

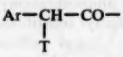
Yoshio Hamashima, 26-20, Katsurahitsuji-saru-cho,, Ukyo, Kyoto, Kyoto; Mitsuru Yoshioka, 2-5-A9-102, Shinsenri-higashi, Toyonaka, Osaka; Hiroshi Tanida, 1-5-9, Mandai, Abeno, Osaka, Osaka; Teruji Tsuji, 1-14-9, Yanagawa-cho, Takatsuki, Osaka; Masayuki Narisada, 3-24-5, Ayukawa, Ibaraki, Osaka; Taichiro Komeno, 2-6-23, Nishisuminoe, Suminoe, Osaka, Osaka, and Wataru Nagata, 6-10, Kawahigashi-cho, Nishinomiya, Hyogo, all of Japan

Filed July 21, 1976, Ser. No. 707,288
Claims priority, application Japan, July 22, 1975, 50-89915
Int. Cl.[2] C07D *501/02*
U.S. Cl. 544—17 8 Claims

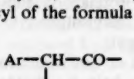
1. A process for preparing a compound of the formula



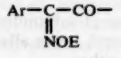
wherein A is amino, sulfenylamino or amino substituted by (1) C_1 to C_{10} alkanoyl, (2) C_1 to C_5 haloalkanoyl, (3) azidoacetyl, (4) cyanoacetyl, (5) acyl of the formula Ar—CQQ′—CO— in which each of Q and Q′ is hydrogen or methyl and Ar is phenyl, dihydrophenyl or a monocyclic hetero aromatic group containing 1–4 hetero ring atoms selected from the group consisting of nitrogen, oxygen and sulfur, (6) 2-sydnon-3-acetyl, (7) (4-pyridon-1-yl)acetyl, (8) acyl of the formula Ar—G—CQQ′—CO— in which Ar, Q and Q′ are as defined above and G is oxygen or sulfur, (9) acyl of the formula



in which Ar is as defined above and T is hydroxy, C_1 to C_{10} acyloxy, carboxy, C_2 to C_7 alkoxycarbonyl, C_2 to C_{15} aralkoxycarbonyl, C_1 to C_{12} aryloxycarbonyl, C_1 to C_7 alkanoyloxy-C_1 to C_3 alkoxycarbonyl, cyano, carbamoyl, sulfo or C_1 to C_7 alkoxysulfonyl, (10) acyl of the formula



in which Ar is as defined above and each of W and W′ is hydrogen, C_2 to C_7 alkoxycarbonyl, C_3 to C_{10} cycloalkyl-C_2 to C_3 alkoxycarbonyl, C_5 to C_8 cycloalkoxycarbonyl, C_1 to C_4 alkylsulfonyl-C_1 to C_4 alkoxycarbonyl, halo C_1 to C_3 alkoxycarbonyl, C_1 to C_{15} aralkoxycarbonyl, C_1 to C_{10} alkanoyl, C_2 to C_{15} aroyl, pyronecarbonyl, thiopyronecarbonyl, pyridonecarbonyl, carbamoyl, guanidinocarbonyl, 3-methyl-2-oxoimidazolidin-1-ylcarbonyl, 3-methanesulfonyl-2-oxoimidazolidin-1-ylcarbonyl, 4-methyl-2,3-dioxopiperazin-1-ylcarbonyl, or 4-ethyl-2,3-dioxopiperazin-1-ylcarbonyl, or W and W′ are combined together with the nitrogen atom to which they are attached to form phthalimido, maleimido or enamino derived from C_5 to C_{10} acetoacetate, C_4 to C_{10} acetacetamide, acetylacetone, acetoacetonitrile or 1,3-cyclopentanedione, (11) acyl of the formula



in which Ar is as defined above and E is hydrogen or C_1 to C_5 alkyl, (12) 5-aminoadipoyl, N-protected 5-aminoadipoyl wherein the protecting group is C_1 to C_{10} alkanoyl, C_1 to C_{10} aralkanoyl, C_2 to C_{11} aroyl, C_1 to C_5 haloalkanoyl or C_2 to C_{10} alkoxycarbonyl, or carboxy-protected 5-aminoadipoyl wherein the protecting group is C_1 to C_5 alkyl, C_2 to C_{21} aralkyl or C_1 to C_{10} aryl, (13) acyl of the formula L-O-CO- in which L is C_1 to C_{10} hydrocarbyl, (14) diacylimido derived from a C_4 to C_{10} polybasic carboxylic acid, (15) C_1 to C_{20} hydrocarbyl, (16) C_1 to C_{20} hydrocarbylidene, (17) C_2 to C_{10} organic silyl, (18) azido, (19) isocyanato, or (20) isocyano,

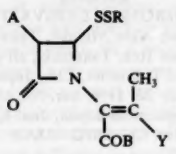
COB is a carboxylic ester group,

RS is benzothiazol-2-ylthio, thiazol-2-ylthio or acetylthio,

Y is C_1 to C_5 alkanoyloxy, C_1 to C_5 alkoxycarbonyloxy, C_7 to C_{12} aralkoxycarbonyloxy, C_6 to C_{11} aroyloxy, C_1 to C_5 alkanesulfonyloxy, C_6 to C_8 arylsulfonyloxy, cyano, thiocyanato, nitro, nitroso, chlorine, bromine or iodine, and

the dotted line represents a 2- or 3- double bond,

which comprises reacting a compound of the formula



wherein A, COB, RS and Y have the same meanings as above, with a base selected from the group consisting of trimethylamine, triethylamine, tripropylamine, butyldimethylamine, 1-methylpiperdine, N-methylmorpholine, quinuclidine, 4-piperidylpyridine, 1,2,2,6,6-pentamethylpiperidine, 1,4-diazabicyclo[2,2,2]octane, N,N-dimethylaniline, 1,8-bisdimethylaminonaphthalene and diisopropylamine.

4,066,642

PROCESS FOR THE PRODUCTION OF THIOPHOSPHORIC ACID ESTERS

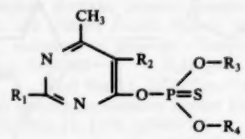
Yel S. Sury, Baton Rouge, La., and James M. Lignos, East Mobile, Ala., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 411,992, Nov. 1, 1973, abandoned. This application Apr. 19, 1976, Ser. No. 678,326

Int. Cl.[2] C07F *9/65*

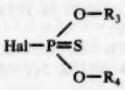
U.S. Cl. 260—251 P **3 Claims**

1. In a process for the production of thiophosphoric acid esters of the formula I



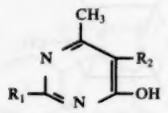
I

wherein R_1 is lower alkyl, lower alkenyl, lower alkoxy(lower-)alkyl or lower alkylmercapto(lower)alkyl, R_2 is hydrogen, lower alkyl or lower alkenyl and R_3 and R_4 are lower alkyl, which comprises reacting a dialkyl phosphoric acid halide of the formula II



II

wherein Hal represents chlorine or bromine and R_3 and R_4 are as defined hereinabove, with a hydroxypyrimidine of the formula III



III

wherein R_1 and R_2 have the significance given to them above, at elevated temperatures and in the presence of an organic solvent and an acid binding agent, the improvement which comprises adding the reactant of formula II and sodium or potassium hydroxide concomitantly to a reaction mixture in reflux consisting essentially of reactant of formula III and an inert non-polar organic solvent at uniform rates over a period of 1 to 7 hours while removing water substantially as it is formed, said reactant of formula III being in a molar excess of about 1 to 5% and said acid binding agent being in a molar excess of about 5 to 10%, and said reaction being carried out in the absence of a catalyst.

4,066,643

PYRAZOLO[1,5-A]PYRIDO[3,2-E]PYRIMIDINE-7-CARBOXYLIC ACID DERIVATIVES

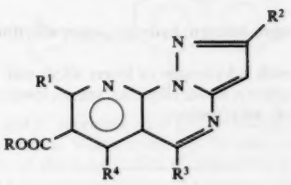
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 630,120, Nov. 7, 1975, Pat. No. 4,026,893. This application Feb. 2, 1977, Ser. No. 764,677

Int. Cl.[2] C07D *471/04;* **A61K** *31/415*

U.S. Cl. 260—256.4 F **7 Claims**

1. A compound of the formula



wherein

R, R^1 and R^3 each is hydrogen or lower alkyl;

R^2 is hydrogen, lower alkyl or phenyl;

R^4 is di-lower alkylamino-lower alkylamino or di-lower alkylamino-lower alkoxy;

and physiologically acceptable salts thereof.

4,066,644

PYRAZOLO [1,5-A]PYRIDO[3,2-E]PYRIMIDINE-7-CARBOXYLIC ACID HETEROCYCLIC DERIVATIVES

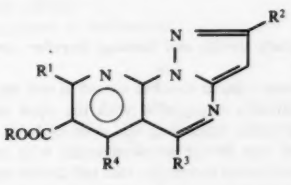
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 630,120, Nov. 7, 1975, Pat. No. 4,026,893. This application Feb. 2, 1977, Ser. No. 764,676

Int. Cl.[2] C07D *401/14;* **A61K** *31/415;* **C07D** *403/14*

U.S. Cl. 260—256.4 F **10 Claims**

1. A compound of the formula



wherein

R, R^1 and R^3 each is hydrogen or lower alkyl;

R^2 is hydrogen, lower alkyl or phenyl;

R^4 is aziridinyl, pyrrolidino, piperidino, pyrazolyl or piperazinyl, said heterocyclics being unsubstituted or substituted with a hydroxy-lower alkyl group or one or two lower alkyl groups;

and physiologically acceptable salts thereof.

4,066,645

DERIVATIVES OF PYRAZOLO [1,5-A]PYRIDO[3,4-E]PYRIMIDINE

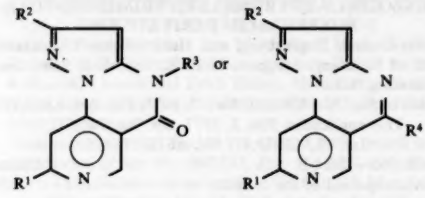
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 9, 1977, Ser. No. 794,769

Int. Cl.[2] C07D *471/04;* **A61K** *31/415*

U.S. Cl. 260—256.4 F **23 Claims**

1. A compound having the formula



wherein

R^1 is hydrogen, halogen, hydroxy, lower alkylthio or lower alkoxy;

R^2 and R^3 each is hydrogen or lower alkyl; and

R^4 is lower alkoxy, lower alkylthio, amino, lower alkylamino or di(lower alkyl)amino.

4,066,646

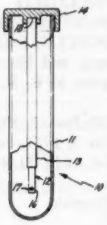
DIAGNOSTIC DEVICE AND HOUSING THEREFOR

Oliver H. LeBlanc, Jr., and William J. Ward, III, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 23, 1976, Ser. No. 753,832

Int. Cl.² G01N *33/16, 31/22, 21/06*

U.S. Cl. 23—259 **7 Claims**



1. A diagnostic device and housing therefor comprising in combination:

an imperforate tubular member closed at one end;

means removably engageable with the open end of said tubular member for sealing said open end;

a functional test device interconnected with said sealing means and spaced therefrom, said test device comprising a specific protein layer on a metallic substrate; and

a longitudinally extending member interconnecting said sealing means and said test device, said member being affixed to both said sealing means and said test device.

4,066,647

SUBSTITUTED 6-(PIPERAZINYL)-10H-PYRIDO[3,2-B]THIENO[3,4-E][1,4]-DIAZEPINES

Sidney Robert Safir, River Edge, and Corris Mabelle Hofmann, Ho-Ho-Kus, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 12, 1976, Ser. No. 741,423

Int. Cl.² C07D *495/14*

U.S. Cl. 260—268 TR **1 Claim**

1. The compound 6-(4-methyl-1-piperazinyl)-10H-pyrido[3,2-b]thieno[3,4-e][1,4]-diazepine.

4,066,648

ISOCHROMAN DERIVATIVES

Yoshikazu Oka, Kobe; Akio Miyake, Takatsuki; Norio Tada, Akashi, and Katsumi Itoh, Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

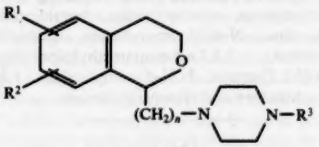
Filed May 28, 1976, Ser. No. 690,928

Claims priority, application Japan, Jan. 1, 1976, 51-1243

Int. Cl.² C07D *405/06*

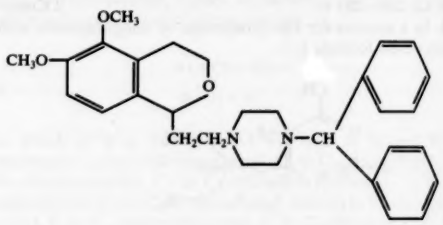
U.S. Cl. 260—268 TR **24 Claims**

1. A compound of the formula



wherein R^1 ia hydrogen, lower alkoxy or hydroxyl and R^2 is lower alkoxy or hydroxyl of R^1 and R^2 when taken together form alkylenedioxy; R^3 is pyridyl, 3 or 4-chlorophenyl, 4-methoxyphenyl, 3,4-dimethoxyphenyl, 3,4,5-trimethoxyphenyl or phenyl and *n* is 1 or 2 or pharmaceutically acceptable salts thereof.

24. A compound of the formula:



and pharmaceutically acceptable salts thereof.

4,066,649

METHOD OF PRODUCING N,N'-(DIMETHYL) PIPERAZINE COMPOUNDS

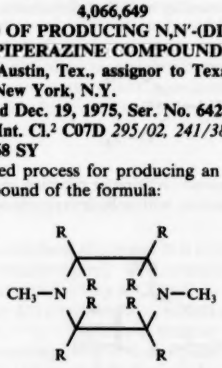
Heinz Schulze, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

Filed Dec. 19, 1975, Ser. No. 642,225

Int. Cl.² C07D *295/02, 241/38*

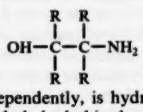
U.S. Cl. 260—268 SY **8 Claims**

1. An improved process for producing an N,N'-(dimethyl) piperazine compound of the formula:



wherein each R is, independently, hydrogen or a C_{1-4} lower alkyl radical comprising the step of:

contacting a monoethanol amine having the formula:



wherein each R, independently, is hydrogen or a C_{1-4} lower alkyl radical with methyl alcohol in the presence of a catalytically effective amount of a phosphorus-containing substance selected from the group consisting of acidic metal phosphates,

orthophosphoric acid, metaphosphoric acid, polyphosphoric acid, orthophosphorous acid, alkyl or aryl phosphate esters, alkyl or aryl phosphite esters, alkyl or aryl substituted phosphorus and phosphoric acids wherein said alkyl groups have from 1 to 8 carbon atoms and said aryl groups have from 6 to 20 carbon atoms, alkali metal monosalts of phosphoric acid and mixtures of the above at a temperature of from 150° C to about 350° C. under pressure sufficient to maintain the mixture essentially in liquid phase; and

recovering from the resultant reaction mixture said N,N'-(dimethyl) piperazine compound.

4,066,650

KETO-ALDEHYDE-AMINE ADDITION PRODUCTS AND METHOD OF MAKING SAME

Laszlo G. Egyud, 12 Redgate Lane, Quissett, Falmouth, Mass. 02543

Continuation of Ser. No. 114,680, Feb. 11, 1971, abandoned. This application Feb. 25, 1975, Ser. No. 552,881

Int. Cl.² C07D *213/69, 207/44*

U.S. Cl. 260—281 G **2 Claims**

1. The compound, which is N'-(2-keto-propane-1-ol)-2,5-dioxo-pyrroline-3-ene.

2. The compound, which is N'-(2-keto-propane-1-ol)-2,6-dioxo-pyridine.

4,066,651

ALKANOIC ACID 2-QUINOLINE DERIVATIVES

David Robert Brittain; Edward Douglas Brown; Walter Hepworth, and Gilbert Joseph Stacey, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 1, 1976, Ser. No. 662,685

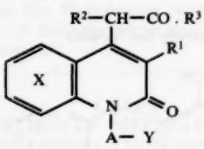
Claims priority, application United Kingdom, Mar. 20, 1975, 11644/75; Oct. 14, 1975, 42043/75

Int. Cl.² C07D *215/22*

U.S. Cl. 260—287 K **5 Claims**

1. A compound selected from the group consisting of α-[1(4-ethylbenzyl)-1,2-dihydro-2-oxoquinol-4-yl]propionic acid, α-[1-(4-trifluoromethylbenzyl)-1,2-dihydro-2-oxoquinol-4-yl]propionic acid, α-(1-benzyl-7-methyl-1,2-dihydro-2-oxoquinol-4-yl)propionic acid, α-(1-benzyl-6-methyl-1,2-dihydro-2-oxoquinol-4-yl)propionic acid, α-[1-(-4-trifluoromethylbenzyl)-6-methyl-1,2-dihydro-2-oxoquinol-4-yl]propionic acid, α-[1-(4-chlorobenzyl)-6-methyl-1,2-dihydro-2-oxoquinol-4-yl]propionic acid, α-(1-benzyl-1,2-dihydro-2-oxoquinol-4-yl)propionic acid, α-[1-(4-methylbenzyl)-1,2-dihydro-2-oxoquinol-4-yl]propionic acid, α[1-(4-methylbenzyl)-6-methyl-1,2-dihydro-2-oxoquinol-4-yl]-propionic acid, and the pharmaceutically acceptable base addition salts thereof.

2. A quinolone alkanoic acid derivative of the formula:



I

wherein A is a methylene, ethylene or propenylene radical; R^1 is hydrogen; R^2 is methyl; R^3 is hydroxy, amino, hydroxylamino, C_{1-6} alkoxy or phenoxy; and wherein the benzene ring X is unsubstituted or bears either a single substituent selected from the group consisting of halogen atoms, methyl, methoxy, nitro and amino or two methyl substituents; and wherein the ring Y is phenyl which may optionally bear a single substituent selected from the group consisting of halogen, methyl, methoxy, methylthio and trifluoromethyl; or a pharmaceutically-acceptable salt thereof.

4,066,652

SUBSTITUTED 8-HYDROXYQUINOLINES AND PROCESS FOR THE PREPARATION THEREOF

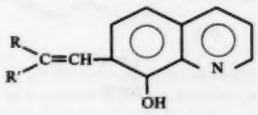
James A. Hartlage, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Sept. 12, 1973, Ser. No. 397,120

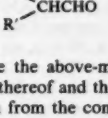
Int. Cl.² C07D *215/26*

U.S. Cl. 260—289 XA **4 Claims**

1. A process for preparing a compound of the formula:



wherein R and R' represent alkyl groups having a sum total of 6–18 carbon atoms, which comprises the steps of heating at a temperature of about 140°–200° C. substantially equal molar amounts of 8-hydroxyquinoline and a hindered aldehyde of the formula:



wherein R and R' have the above-mentioned meanings, to effect the condensation thereof and the concomitant removal of water of dehydration from the condensate and thereupon distilling the reaction product to recover the resultant alkylate.

4,066,653

1-IMINO-3-(4-IMINO-5-THIAZOLIDINYLIDENE)ISOINDOLINES

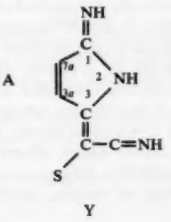
Nathan N. Crounse, and Nicholas A. Ambrosiano, both of Cincinnati, Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 564,725, April 3, 1975, Pat. No. 3,993,658, which is a continuation-in-part of Ser. No. 308,163, Nov. 20, 1972, Pat. No. 3,919,235. This application June 1, 1976, Ser. No. 691,637

Int. Cl.² C07D *417/14*

U.S. Cl. 260—293.61 **4 Claims**

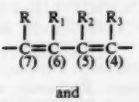
1. A compound of the formula



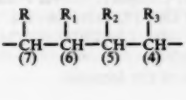
Y

wherein:

A is a divalent radical combining with the —C=C— portion of the molecule to which it is attached to form a six-membered carbocyclic ring and is selected from the group consisting of



and



where in each instance C(7) and C(4) are bonded to C(7a) and C(3a) respectively, and in which R, R_1, R_2 and R_3 are the sam or different and are selected from the class consisting of hydrogen, alkyl having one to three carbon atoms, alkoxy having one to three carbon atoms, halo, trifluoromethyl, phenyl and phenyl substituted by alkyl having one to three carbon atoms, alkoxy having one to three carbon atoms and halogen; and

Y is a divalent radical combining with the —S—C—C— portion of the molecule to form a five-membered heterocyclic ring having the same orientation as a thiazole ring and is

in which N=B is di-lower-alkylamino, piperidino, pyrrolidino, morpholino, (lower-alkyl)-(phenyl)-amino or (lower-alkyl)-(phenyl-lower-alkyl)amino.

4,066,654

1-TRIARYLALKYL-4-PHENYL-4-PIPERIDINE CARBOXYLIC ACIDS AND DERIVATIVES

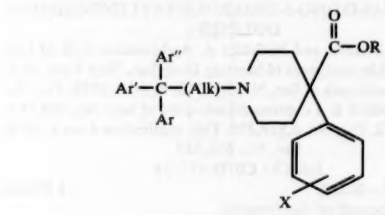
Gilbert W. Adelstein, Evanston; Esam Z. Dajani, Buffalo Grove, and Chung Hwai Yen, Skokie, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 568,439, April 16, 1975, Pat. No. 3,998,832. This application Nov. 15, 1976, Ser. No. 741,589

Int. Cl.[2] C07D *401/06, 211/64*

U.S. Cl. 260—293.69 **13 Claims**

1. A compound of the formula



wherein the Alk is straight or branched chain alkylene containing 2–4 carbon atoms; Ar and Ar′ are phenyl, alkyl substituted phenyl wherein the alkyl contains from 1–4 carbon atoms or halo substituted phenyl; Ar″ is phenyl, alkyl substituted phenyl wherein the alkyl contains 1–4 carbon atoms, halo substituted phenyl or pyridyl; X is hydrogen, halogen, trifluoromethyl or alkyl having from 1–4 carbon atoms; R is hydrogen, alkyl having from 1–7 carbon atoms, alkenyl having 3–7 carbon atoms, Ar″ as hereinbefore defined, or a cation selected from the group consisting of sodium, potassium, ammonium or calcium/2.

10. A compound according to claim 1 which is 1-[3,3-diphenyl-3-(2-pyridyl)propyl]-4-phenyl-4-piperidine carboxylic acid hydrochloride.

4,066,655

4,10-DIHYDRO-4,10-DIOXO-1H-1-BENZOPYRANO[3,2-B]PYRIDINE-3-CARBOXYLIC ACIDS, SALTS AND ESTERS

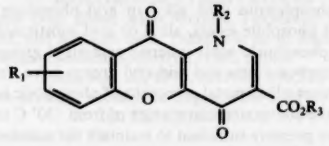
David T. Connor, Parsippany; Patricia A. Young, Madison, and Max von Strandtmann, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 29, 1976, Ser. No. 736,926

Int. Cl.[2] C07D *491/04*

U.S. Cl. 260—295.5 T **15 Claims**

1. A compound of the formula:



I.

wherein R_1 is hydrogen, lower alkyl, halogen, hydroxy or lower alkoxy; R_2 is hydrogen phenyl lower alkyl or lower alkyl; R_3 is hydrogen or lower alkyl and their pharmaceutically acceptable salts.

4,066,656

[1,2,5,6]TETRATHIOCINO-[3,4-C;7,8-C′]DIISOTHIAZOLE-3,8-DICARBONITRILE

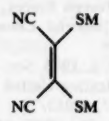
Susan Anne Vladuchick, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 13, 1976, Ser. No. 704,973

Int. Cl.[2] C07D *513/14*

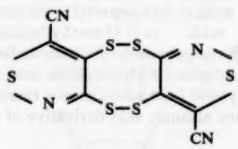
U.S. Cl. 260—302 F **20 Claims**

1. A process comprising (1) contacting a 1,2-dimercaptomaleonitrile salt of the formula

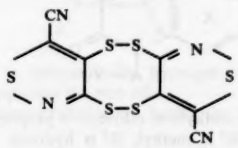


where M is an alkali metal or bis[tetra(lower alkyl ammonium)],

with sulfur in an alcohol solvent at a temperature of at least 50° C and (2) contacting the resulting product with an oxidizing agent selected from the group consisting of bromine, hydrogen peroxide, iodine, sodium hypochlorite, sodium hypobromite, iron (III) chloride and potassium hexacyanoferrate (III) to form:

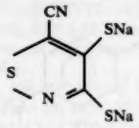


15. A compound having the formula



16. A process comprising heating the compound of claim 15 in an organic solvent at a temperature in the range of about 150°–300° C to prepare 1,4-dithiino-[2,3-c; 6,5-c′]diisothiazole-3,7-dicarbonitrile.

18. A process comprising heating the compound of claim 15 in an organic solvent at a temperature in the range of about 80°–155° C in the presence of a catalytic amount of



to prepare 1,4-dithiino[2,3-c; 6,5-c']diisothiazole-3,7-dicarbonitrile.

4,066,657

2-[(CARBOXY)(TRIPHENYLMETHYLAMINO)METHYL]-5,5-DIMETHYL-3-THIAZOLINE

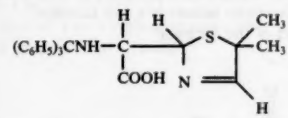
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 680,423, April 26, 1976, Pat. No. 4,031,077, which is a continuation-in-part of Ser. No. 619,634, Oct. 6, 1975, abandoned. This application Oct. 29, 1976, Ser. No. 736,956

Int. Cl.² C07D *277/10*

U.S. Cl. 260—306.7 R **1 Claim**

1. A compound of the formula (II)



(II)

and the sodium and potassium salts thereof.

4,066,658

RESOLUTION OF D,L-DEHYDROPROLINE

Arthur Martin Felix, West Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 11, 1975, Ser. No. 603,404

Int. Cl.² C07D *207/22*

U.S. Cl. 260—326.2 **6 Claims**

1. A method for the preparation of L-3,4-dehydroproline comprising in combination the steps of:

A. treating N-protected D,L-3,4-dehydroproline with R(+)-alpha-methyl-p-nitrobenzylamine so as to form the corresponding diastereomeric salt, the said N-protecting group being selected from conventional N-protecting groups which can be deblocked without racemization of the resolved compound;

B. selectively crystallizing the N-protected L-3,4-dehydroproline (R)-alpha-methyl-p-nitrophenethyl ammonium salt from solution;

C. decomposing the aforesaid diastereomeric salt with cold aqueous weak acid so as to produce N-protected-L-3,4-dehydroproline; and

D. removing the N-protecting group under conditions which do not cause racemization thereby yielding L-3,4-dehydroproline.

4,066,659

METHOD OF PREPARATION OF 3-(3-CARBOXY-4-HYDROXYPHENYL)-4,5-DIHYDRO-2-PHENYLBENZ (E) INDOLE AND VALUABLE INTERMEDIATES RELATED THERETO

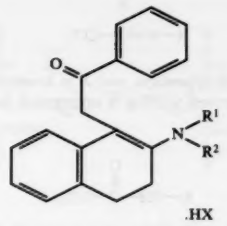
Richard C. Effland, Bridgewater, N.J., assignor to American Hoechst Corporation, Bridgewater, N.J.

Filed June 3, 1976, Ser. No. 692,331

Int. Cl.² C07D *209/18*

U.S. Cl. 260—326.13 F **14 Claims**

1. A method of preparing 3-(3-carboxy-4-hydroxyphenyl)-4,5-dihydro-2-phenylbenz[e]indole which comprises reacting an enammonium salt which, in one of the possible tautomeric forms, is represented by the formula



wherein R^1 and R^2 are the same or different and each represents alkyl of from 1 to 6 carbon atoms or, together with the nitrogen atom to which they are attached, form a pyrrolidino, or piperidino ring and X is bromine or chlorine with 5-aminosalicylic acid in a solvent and at a temperature of from about ambient to the boiling point of the solvent.

4,066,660

INTERMEDIATES IN THE PREPARATION OF INDOLOBENZOXAZEPINES

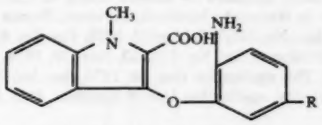
Richard E. Brown, East Hanover, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 620,734, Oct. 8, 1975, Pat. No. 4,013,641. This application Oct. 22, 1976, Ser. No. 734,791

Int. Cl.² C07D *209/20*

U.S. Cl. 260—326.14 R **3 Claims**

1. Compounds of the general formula



wherein R is —H or —Cl.

4,066,661

PROCESS FOR THE PREPARATION OF SUBSTITUTED TRICHLOROACETAMIDINE DERIVATIVES

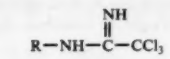
George H. Denny, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed June 1, 1976, Ser. No. 691,759

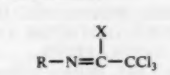
Int. Cl.² C07D *209/14*

U.S. Cl. 260—326.15 **9 Claims**

1. A process for the preparation of a compound having the formula

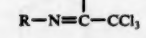


wherein R is 3-indolylmethyl, which comprises treating a compound having the formula:

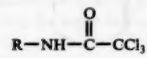


wherein R is as previously defined and X is loweralkoxy or halogen, with ammonia at a temperature of from room temperature to 100° C for a period of from 5 minutes to 1 week.

3. A process for the preparation of a compound having the formula:

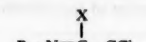


wherein R is 3-indolylmethyl, and X is loweralkoxy or halogen, which comprises treating a compound having the formula:



wherein R is as previously defined, with an imidating agent selected from triloweralkyloxonum tetrafluoroborate, at about room temperature for from 1 to 24 hours or phosphorous pentahalide at about 100° to 125° C for from 2 to 6 hours.

8. A compound having the formula:



wherein R is 3-indolylmethyl; and X is loweralkoxy or halogen.

4,066,662

N-SUBSTITUTED-2-AMINOMETHYL-3-AZABICYCLO(3,3,0)OCTANE COMPOUNDS

Laszlo Beregi, Boulogne, Seine; Pierre Hugon, Rueil-Malmaison; Xavier Pascaud, Paris, and Jean-Claude Poignant, Bures, all of France, assignors to Science Union et Cie., Societe Francaise de Recherche Medicale, Suresnes, France

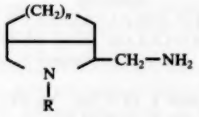
Division of Ser. No. 685,757, May 13, 1976, Pat. No. 4,042,598, which is a division of Ser. No. 525,623, Nov. 20, 1974, Pat. No. 3,972,994. This application Dec. 30, 1976, Ser. No. 755,476

Claims priority, application United Kingdom, Dec. 14, 1973, 58034/73

Int. Cl.² C07D *209/52;* **A61K** *31/40*

U.S. Cl. 260—326.85 **4 Claims**

1. A compound selected from the group consisting of bicycloalkanes compounds of the formula:



wherein *n* is 1, and wherein R is selected from the group consisting of saturated and unsaturated aliphatic hydrocarbon groups having one to five carbon atoms inclusive in the form of a straight or branched chain.

4,066,663

6,11-DIHYDRODIBENZO-[B. E.]-THIEPIN-11-ONE-3-ALDEHYDE AND 3-ACETAL DERIVATIVES

Jack Ackrell, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

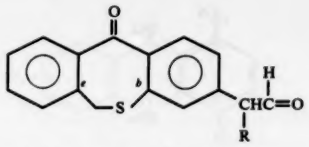
Filed July 1, 1976, Ser. No. 701,780

Int. Cl.² C07D *337/12*

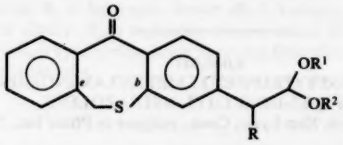
U.S. Cl. 260—327 B **18 Claims**

1. A compound selected from the group of those represented by the formulas

(A)



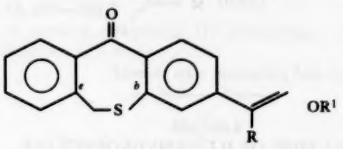
(B)



wherein R represents hydrogen or methyl, and each of R^1 and R^2, which can be the same or different, represents a lower alkyl group of 1 to 6 carbon atoms, or together represent a lower alkylene radical of 2 to 6 carbon atoms, provided that when R is methyl, the compounds are (dl) mixtures, and when R^1 and R^2 are different, the compounds are pairs of diasteroisomers and each diasteroisomeric isomer is a (dl) mixture.

14. A compound of the formula:

(C)



wherein R is hydrogen or methyl and R^1 is a lower alkyl group of 1 to 6 carbon atoms.

4,066,664

INTERMEDIATES FOR PREPARING α-CARBOXY-α-(3-THIENYL)PENICILLIN AND CEPHALOSPORIN DERIVATIVES

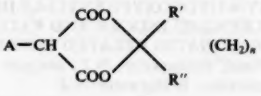
Pierre Crooij, Genval, and Guy Simonet, Perwez, both of Belgium, assignors to Recherche et Industrie Therapeutiques, Belgium

Division of Ser. No. 566,645, April 8, 1975, abandoned. This application Sept. 27, 1976, Ser. No. 727,198

Int. Cl.² C07D *333/24*

U.S. Cl. 260—332.2 H **4 Claims**

1. A compound of the formula:



wherein:

A is 3-thienyl; and

R′ and R″ are either identical or different and, when $n = 0$, represent lower alkyl radicals of from 1 to 4 carbon atoms, or, when *n* is an integer between 1 and 7, R′ and R″ are methylene radicals.

4,066,665

2-ALKYLAMINO-α-PHENYL-1-CYCLOHEXENE-1-METHYLENEIMINE, ITS SALTS AND PREPARATION

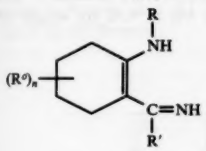
William G. Salmond, Mount Arlington, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 160,960, July 8, 1971, abandoned. This application June 19, 1974, Ser. No. 480,626

Int. Cl.[2] C07D *333/12*

U.S. Cl. 260—332.5 **10 Claims**

1. A compound of the formula:



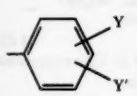
wherein

R° is alkyl of 1 to 3 carbon atoms,

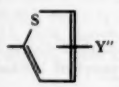
n is 0, 1 or 2,

R is alkyl of 1 to 5 carbon atoms, and

R′ is a group of the formula

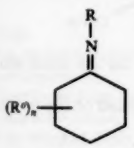


in which Y and Y′ are independently hydrogen, alkyl of 1 to 2 carbon atoms, alkoxy of 1 or 2 carbon atoms, fluoro or chloro or one of Y and Y′ is trifluoromethyl while the other is hydrogen, or a group of the formula



in which Y″ is hydrogen, fluoro, chloro, or alkyl of 1 to 3 carbon atoms.

7. A process for producing a compound of claim **1** which comprises reacting a cyclohexylidine of the formula:

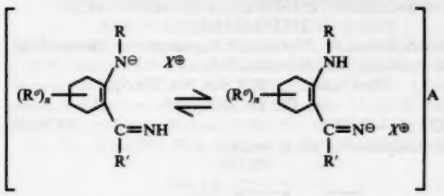


in which R, R° and *n* are defined in claim **1** with:

1. a metal-containing base selected from the group consisting of methyl magnesium iodide and an alkali metal salt of a secondary amine; and 2 a compound of the formula:

$$R' - C \equiv N$$

in which R′ is as defined in claim **1**, in an inert solvent to form a solution of the Salt A:



in which R, R°, R′ and *n* are as defined in claim **1**, and X is magnesium or an alkali metal corresponding to the metal in the base, and quenching said solution with water.

4,066,666

15-OXASTEROIDS

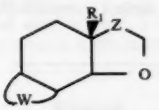
Perry Rosen, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 528,115, Nov. 29, 1974, Pat. No. 3,987,066, which is a division of Ser. No. 217,956, Jan. 14, 1972, Pat. No. 3,872,076. This application July 2, 1976, Ser. No. 702,243

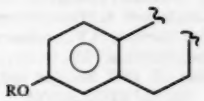
Int. Cl.[2] C07D *317/72, 319/04*

U.S. Cl. 260—340.9 AS **3 Claims**

1. A compound of the formula



wherein R_1 is lower alkyl of from 1 to 5 carbon atoms; W is



wherein R is hydrogen, lower alkyl, cycloalkyl, lower alkanoyl or aroyl and Z is ketal protected carbonyl selected from the group consisting of ethylenedioxymethylene, 1,3-propylenedioxymethylene and 2,3-butylenedioxymethylene.

4,066,667

9-HYDROXY-7,8,9,10-TETRAHYDRO-6H, DIBENZO[B][D] PYRANS AND PYRANONES

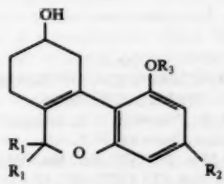
Cheuk Man Lee, Libertyville; Raymond John Michaels, Mundelein, both of Ill., and Louis Selig Harris, Richmond, Va., assignors to Abbott Laboratories, North Chicago, Ill.

Filed July 7, 1975, Ser. No. 593,352

Int. Cl.[2] C07D *311/78;* A61K *31/35, 31/335*

U.S. Cl. 260—345.3 **9 Claims**

1. A compound of the formula



wherein R_1 is methyl, R_2 is C_1–C_{20} alkyl and R_3 is hydrogen, loweralkyl, C_2–C_6 alkenyl or C_2–C_6 alkynyl.

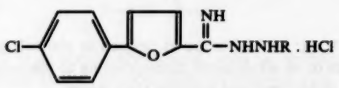
4,066,668

5-(4-CHLOROPHENYL)-2-FURIMIDIC ACID HYDRAZIDES

Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Mar. 21, 1977, Ser. No. 779,612
Int. Cl.² C07D *307/68*
U.S. Cl. 260—347.3 **3 Claims**

1. A compound of the formula:



wherein R represents hydrogen or formyl.

4,066,669

DIETHYL ACETAMIDO[5-(4-NITROPHENYL)FURFURYL]MALONATE

Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Mar. 11, 1977, Ser. No. 776,649
Int. Cl.² C07D *307/54*
U.S. Cl. 260—347.5 **1 Claim**

1. The compound diethyl acetamido[5-(4-nitrophenyl)furfuryl]malonate.

4,066,670

N-DIMETHYLAMINOPROPYL-5-(2-NITROPHENYL)-2-FURANCARBOXIMIDAMIDE DIHYDROCHLORIDE MONOHYDRATE

Stanford S. Pelosi, Jr.; Ronald E. White; George C. Wright, and Chia Nien Yu, all of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jan. 25, 1977, Ser. No. 765,621
Int. Cl.² C07D *307/68*
U.S. Cl. 260—347.7 **1 Claim**

1. The compound N-dimethylaminopropyl-5-(2-nitrophenyl)-2-furancarboximidamide dihydrochloride monohydrate.

4,066,671

(2,2-DIETHOXYETHYL)DIMETHYL[5-(4-NITROPHENYL)-2-FUROYLMETHYL]AMMONIUM CHLORIDE HEMIHYDRATE

Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Feb. 7, 1977, Ser. No. 766,123
Int. Cl.² C07D *307/52*
U.S. Cl. 260—347.7 **1 Claim**

1. The compound (2,2-diethoxyethyl)dimethyl[5-(4-nitrophenyl)-2-furoylmethyl]ammonium chloride hemihydrate.

4,066,672

DIETHYL[5-(4-NITROPHENYL)FURFURYL]AMINE HYDROCHLORIDE

Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Mar. 24, 1977, Ser. No. 780,857
Int. Cl.² C07D *307/52*
U.S. Cl. 260—347.7 **1 Claim**

1. The compound diethyl[5-(4-nitrophenyl)furfuryl]amine hydrochloride.

4,066,673

PROCESS FOR MAKING QUATERNARY AMINES OF EPICHLOROHYDRIN

Joseph B. Doughty, Sullivan's Island, S.C., and Robert E. Klem, Columbia, Md., assignors to Westvaco Corporation, New York, N.Y.

Filed Feb. 25, 1974, Ser. No. 445,067
Int. Cl.² C07D *301/24, 301/00*
U.S. Cl. 260—348.13 **2 Claims**

1. In a process for preparing a 1,2-epoxy propyl trialkylamine chloride, the improvement which comprises; reacting epichlorohydrin in a methanol solution with a stoichiometric amount of trialkylamine at a temperature between 0° and 60° C., said methanol being about 5% to 70% by weight of the total.

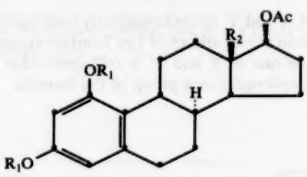
4,066,674

PROCESS FOR THE PREPARATION OF 1,3-OXYGENATED 8α-ESTRATRIENES AND NOVEL INTERMEDIATES OBTAINED THEREFROM

Ulrich Eder; Gerhard Sauer; Gregor Haffer; Guenter Neef, and Rudolf Wiechert, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

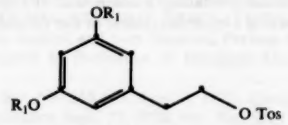
Filed Nov. 12, 1976, Ser. No. 741,497
Int. Cl.² C07J *1/00*
U.S. Cl. 260—397.5 **11 Claims**

1. A process for the production of a 1,3-oxygenated-8α-estratriene optical isomer of the formula



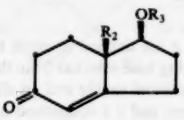
wherein R_1 is alkyl or aralkyl of up to 8 carbon atoms, R_2 is alkyl of 1–5 carbon atoms and Ac is alkanoyl of 1–8 carbon atoms, which comprises the steps of:

a. condensing, in the presence of a deprotonating agent, a compound of the formula

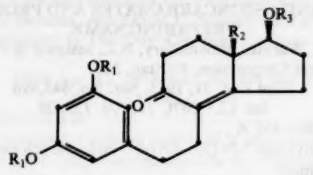


wherein R_1 is alkyl or aralkyl of up to 8 carbon atoms and Tos is tosyloxy,

with a tetrahydroindane-5-one compound of the formula

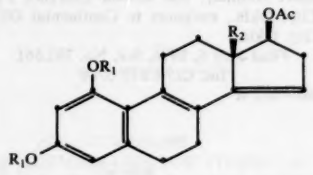


wherein R_2 is alkyl of 1-5 carbon atoms and R_3 is tert.-butyl, tetrahydropyranyl, tetrahydrofuranyl, α-ethoxyethyl, trimethylsilyl or tri-p-xylylsilyl, to produce a condensate of the formula



wherein R_1, R_2, and R_3 are as above;

b. cyclizing the condensate in the presence of a strong acid and a carboxylic acid of 1–8 carbon atoms to an estrapentaene of the formula



wherein R_1, R_2, and Ac are as above; and

c. hydrogenating the estrapentaene in the presence of a hydrogenation catalyst to said 1,3-oxygenated-8α-estratriene.

4,066,675

9-THIA- AND OXOTHIA- AND 9-DIOXOTHIA-11,12-SECO-PROSTAGLANDINS AND PROCESSES

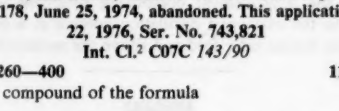
Edward J. Cragoe, Jr.; John B. Bicking, and Robert L. Smith, all of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 669,006, March 22, 1976, Pat. No. 4,018,802, which is a continuation-in-part of Ser. No. 566,566, April 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 483,178, June 25, 1974, abandoned. This application Nov. 22, 1976, Ser. No. 743,821

Int. Cl.[2] C07C *143/90*

U.S. Cl. 260—400 **11 Claims**

1. The compound of the formula



wherein

R is carboxy, a carboxy salt, or a carboxy ester; ;p1 A is methylene;

Y is selected from the group consisting of ethylene, vinylene, and ethynylene;

R^1 is selected from the group consisting of methyl, ethyl, 2-hydroxyethyl, 2-(loweralkoxy)ethyl, and vinyl;

n is 0, 1, or 2;

Z is selected from the group consisting of ethylene, vinylene, and ethynylene;

R^2 is hydrogen or methyl;

R^3 is hydrogen;

R^4 is hydrogen or methyl;

R^5, taken together as a single substituent with R^2 and the carbon chain joining R^2 and R^5, is a carbocyclic ring with from 5–9 members.

4,066,676

PHOTOSENSITIVE MATERIAL COMPRISING POLYACETYLENIC AMINE SALTS

Melvin S. Bloom, Rochester, and Sally S. Fico, Bergen, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 440,229, Feb. 6, 1974, Pat. No. 3,954,816, which is a division of Ser. No. 315,249, Dec. 14, 1972, Pat. No. 3,844,791, which is a division of Ser. No. 153,059, June 14, 1971, Pat. No. 3,743,505. This application Jan. 30, 1976, Ser. No. 653,807

Int. Cl.[2] C07C *87/30*

U.S. Cl. 260—402.5 **4 Claims**

1. Radiation-sensitive crystalline polyacetylenic amine salts having the structural formula:

$$D - (CH_2)_x(C{\equiv}C)_n(CH_2)_y\text{-}COO^-A^+$$

wherein:

n is an integer greater than 1;

x and *y* are each an integer from 0 to 10;

A is $NRR^1R^2R^3$ wherein R, R^1, R^2 and R^3 are H, alkyl of from 1 to 15 carbon atoms, aryl or substituted alkyl having substituents chosen from the group consisting of hydroxy, amino, carboxy and methoxy substituents;

D is selected from the group consisting of

CH_3,

$COOR^4$, and

$CONHR^5$, wherein

R^4 is H or lower alkyl,

R^5 is substituted alkyl of from 3 to 8 carbon atoms in which the substituent is alkylthio.

4,066,677

TWO-STAGE PROCESS FOR SEPARATING MIXED FATTY-ACID ESTERS

Armand J. Rosset, Clarendon Hills, and Richard W. Neuzil, Downers Grove, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 710,829, Aug. 2, 1976. This application Sept. 24, 1976, Ser. No. 726,363

Int. Cl.[2] C09F *5/10*

U.S. Cl. 260—428.5 **38 Claims**

1. A process for separating an ester of a polyethanoid fatty acid and an ester of a monoethanoid fatty acid from a first mixture comprising an ester of a polyethanoid fatty acid, an ester of a monoethanoid fatty acid and an ester of a saturated fatty acid which process comprises the steps of:

a. contacting at a temperature within the range of from about 20° to about 250° C. and a pressure within the range from about atmospheric to about 500 psig. said first mixture with a first adsorbent comprising a X or Y zeolite containing at exchangeable cationic sites at least one cation selected from the group consisting of cations of metals of Group IA of the Periodic Table of Elements and combinations thereof thereby selectively adsorbing said ester of a polyethanoid fatty acid and thereafter recovering said ester of a polyethanoid fatty acid;

b. removing from the first adsorbent a raffinate output stream comprising said ester of a monoethanoid fatty acid and said ester of a saturated fatty acid; and,

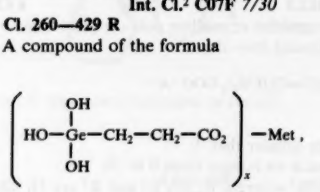
c. contacting at a temperature within the range of from about 20° to about 250° C. and a pressure within the range from about atmospheric to about 500 psig. a second mixture comprising said raffinate output stream with a second adsorbent comprising a X or a Y zeolite containing at exchangeable cationic sites copper cations and one or more second cations selected from the group consisting of sodium, potassium, rubidium dand cesium, thereby selectively adsorbing said ester of a monoethanoid fatty acid and thereafter recovering said ester of a monoethanoid fatty acid.

4,066,678
3-TRIHYDROXYGERMYL PROPIONIC ACID AND ITS SALTS AND A PROCESS FOR THE PRODUCTION THEREOF

Ryuichi Sato, Oizumimachi; Akira Ishikawa, Tokyo; Yukihito Ishida, Tokyo; Hiroshi Sato, Tokyo; Setsuo Tomisawa, Tokyo; Shigeshi Toyoshima, Tokyo, and Shiro Ikegami, Funabashi, all of Japan, assignors to Ryuichi Sato, Oizumimachi, Japan

Filed June 18, 1976, Ser. No. 697,568
Claims priority, application Belgium, Oct. 23, 1975, 161181
Int. Cl.[2] C07F *7/30*
U.S. Cl. 260—429 R 5 Claims

1. A compound of the formula



wherein Met is a monovalent cation selected from the group consisting of Na, K, NH_4, and $NH_2(CH_3)_2$, or a divalent cation selected from the group consisting of Ca and Mg, and wherein x is 1 when Met is a monovalent cation and x is 2 when Met is a divalent cation.

4,066,679
BIMETALLIC SALTS AND DERIVATIVES THEREOF, THEIR PREPARATION AND USE IN THE COMPLEXING OF LIGANDS

Robert B. Long, Atlantic Highlands; Fred A. Caruso, Elizabeth, both of N.J.; Richard J. DeFeo, Baton Rouge, La., and David G. Walker, Baytown, Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 144,302, May 17, 1971, Pat. No. 3,887,600, which is a division of Ser. No. 805,912, Sept. 3, 1968, Pat. No. 3,651,159. This application Mar. 12, 1975, Ser. No. 557,494
Int. Cl.[2] C07F *1/08*
U.S. Cl. 260—438.1 10 Claims

1. A complex bimetallic salt having the generic formula $CuAlX_4L_m$ wherein X is selected from the group consisting of chlorine, bromine and fluorine atoms, L is a complexible ligand selected from the group consisting of a C_2–C_6 acetylene, a C_4–C_{10} conjugated diolefin, a C_6–C_{16} polyolefin, a C_5–C_{10} cyclic olefin and a C_3–C_6 diolefin and m is equal to the complexing stoichiometry of L and is an integer ranging from 1 to 4.

4,066,680
PROCESS FOR MAKING ALPHA,OMEGA-SILOXANEDIOLS

Richard N. Lewis, Tecumseh, and Eugene R. Martin, Onsted, both of Mich., assignors to SWS Silicones Corporation, Adrian, Mich.

Filed Oct. 18, 1976, Ser. No. 733,564
Int. Cl.[2] C07F *7/08*
U.S. Cl. 260—448.2 E 8 Claims

1. A process of making alpha,omega-siloxanediols of the formula $HO(R_2SiO)_nH$, in which at least 50 percent of the R groups are methyl and the remaining R groups are selected from the class consisting of vinyl and phenyl and n is a number of from 3 to 25, which comprises heating an alpha,omega-diacyloxysiloxane with an aqueous solution having a pH of from 8 to 11 to a temperature of at least 50° C.

4,066,681
THIOL- AND THIONCARBAMATES AND PROCESS FOR PREPARING SAME

Michael P. Wachter, Bloomsbury, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

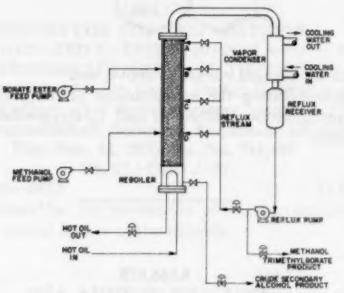
Filed Dec. 31, 1975, Ser. No. 645,496
Int. Cl.[2] C07C *155/09, 155/08*
U.S. Cl. 260—455 A 1 Claim

1. Ethyl-exo-5-N-(5,6-dihydro-endo-dicyclopentadienyl)-thiolcarbamate.

4,066,682
TRANSESTERIFICATION OF BORATE ESTERS FOR PRODUCING SECONDARY ALCOHOLS

Leland Robert Holliday, and Ronald Laurence Poe, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed July 6, 1976, Ser. No. 702,561
Int. Cl.[2] C07F *5/04*
U.S. Cl. 260—462 R 3 Claims



1. An improved method for the transesterification of secondary alcohol borate esters containing alkyl groups having from about 6 to about 20 carbon atoms with methanol wherein borate esters and methanol are reacted in a transesterification column and a portion of the extractive distillation column overhead is separated and returned to the column as a reflux stream, the improvement comprising returning said reflux stream to the extractive distillation column at a point at or below the borate ester feed and above the methanol feed.

4,066,683
PROCESS FOR THE PREPARATION OF DIAMINOMALEONITRILE

Hideo Shidara, Ichinomiya, Japan, assignor to Nippon Chemicals Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1977, Ser. No. 756,182
Int. Cl.[2] C07C *120/00*
U.S. Cl. 260—465.5 R 13 Claims

1. A process for the preparation of diaminoaleonitrile comprising polymerizing hydrogen cyanide in the presence of an alkyl aluminum compound having the general formula

wherein R_1 is alkyl containing 1 to 10 carbon atoms, and R_2 and R_3 are hydrogen, halogen having 17 to 53 of atomic number or alkyl containing 1 to 10 carbon atoms, wherein the alkyl aluminum compound is used in amounts of the molar ratio to hydrogen cyanide of from 0.001 to 1, and wherein the reaction is carried out at a temperature of from about −20° Cto about +150° C.

4,066,684

PREPARATION OF PEPTIDES

Linneaus C. Dorman, and Edwin C. Steiner, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 15, 1974, Ser. No. 460,840
Int. Cl.[2] C07C *125/04*
U.S. Cl. 260—112.5 R 1 Claim

1. In the process for making methyl N,N'-dicarbobenzyloxy-ε-aminocaproyl-L-lysyl-ε-aminocaproate by reacting the azide of N,N'-dicarbobenzyloxy-ε-aminocaproyl-L-lysine hydrazide with methyl ε-aminocaproate, the improvement wherein said azide is provided as the reaction mixture formed by nitrosylating the corresponding hydrazide in an essentially anhydrous organic solvent medium using as the source of nitrous acid the alkali metal nitrite complex with the cyclic pentamer of ethylene oxide.

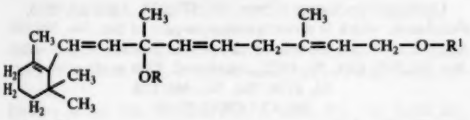
4,066,685

INTERMEDIATES FOR VITAMIN A

William Oroshnik, Plainfield, N.J., assignor to SCM Corporation, New York, N.Y.

Division of Ser. No. 353,215, April 23, 1973, Pat. No. 3,949,006, which is a continuation-in-part of Ser. No. 246,939, April 24, 1972, abandoned. This application Apr. 10, 1975, Ser. No. 566,982
Int. Cl.[2] C07C *175/00*
U.S. Cl. 560—260 5 Claims

1. Compounds having the general formula:



in which R is lower alkyl, lower alkenyl, phenyl or aralkyl of up to 10 carbon atoms, and R^1 is hydrogen or CO-R^2, R^2 being lower alkyl, phenyl, or aralkyl of up to 10 carbon atoms.

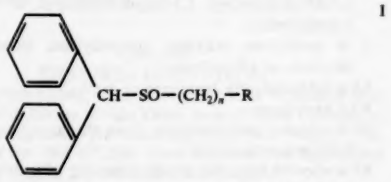
4,066,686

NEW BENZHYDRYSULPHINYL DERIVATIVES

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, Maisons Alfort, France

Filed Sept. 30, 1976, Ser. No. 728,054
Claims priority, application United Kingdom, Oct. 2, 1975, 40419/75
Int. Cl.[2] C07C *83/10*; A61K *31/185*
U.S. Cl. 260—500.5 H 4 Claims

1. Benzhydrylsulphinyl compounds of the formula:



in which *n* is 1, 2 or 3 and R is C(=O)NHOH and their addition salts.

4,066,687

2,3-CARBOXY ALKOXY SUCCINIC ACID AND SALTS THEREOF

Gunner E. Nelson, and Tillmon H. Pearson, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 385,545, Aug. 3, 1973, Pat. No. 3,980,578, which is a continuation-in-part of Ser. No. 153,816, June 16, 1971, Pat. No. 3,784,486. This application May 3, 1976, Ser. No. 682,320
Int. Cl.[2] C07C *59/12*
U.S. Cl. 260—535 P 10 Claims

1. α,α'-carboxyalkoxy succinic acid and the water soluble salts thereof.

4,066,688

CHEMICAL PROCESS

Walter W. Lawrence, Jr.; Tom W. McKay, and Karl E. Wiegand, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 131,885, April 7, 1971, Pat. No. 3,770,796. This application Jan. 19, 1973, Ser. No. 325,174
Int. Cl.[2] C07C *59/16*
U.S. Cl. 260—535 P 31 Claims

1. A process for producing alkali metal salts of citric acid which comprises:

A - forming a system of acetone dicarboxyl ions, cyanide ions and alkali metal ions in the proportions of about 1 mol equivalent cyanide ions and from about 1.5 to about 2.0 alkali metal atom equivalents per mol equivalent acetone dicarboxyl ions, and reacting said system for from about 0.1 to about 72 hours, at a temperature of from about 0° to about 100° C, and

B - reacting the system from Step A with caustic in a solution containing from about 5 to about 40 percent by weight caustic of an alkali metal for from about 0.25 to about 8 hours at from about −10° to about 180° C.

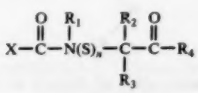
4,066,689

KETOALKANESULFENYLCARBAMOYL AND KETOALKANETHIOSULFENYLCARBAMOYL HALIDES

Themistocles D. J. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 20, 1976, Ser. No. 688,223
Int. Cl.[2] C07C *125/00, 125/03*
U.S. Cl. 260—544 C 20 Claims

1. A compound of the formula:



wherein:

R_1 is alkyl;

R_2 is alkyl or chlorine;

R_3 is hydrogen, alkyl, phenyl, alkoxycarbonyl, alkanoyl or phenoxycarbonyl;

R_4 is hydrogen, alkyl, phenoxy, alkoxy or phenyl or R_3 and R_4 together may form as alkylene chain completing a five or six membered alicyclic ketone or dione;

n is 1 or 2;

X is chlorine or fluorine;

wherein R_1, R_2, R_3 and R_4 substituents individually may not include more than 6 aliphatic carbons.

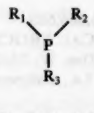
4,066,690

PROCESS FOR THE PREPARING α-CHLOROACRYLIC ACID CHLORIDES

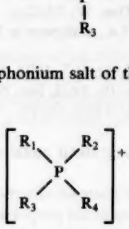
Dieter-Bernd Reuschling, Butzbach, and Harald Jensen, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 524,811, Nov. 18, 1974, abandoned. This application Sept. 20, 1976, Ser. No. 724,959
Claims priority, application Germany, July 24, 1975, 2357677
Int. Cl.[2] C07C *51/58*
U.S. Cl. 260—544 Y 16 Claims

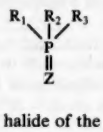
1. A process for preparing α-chloroacrylic acid chloride by dehydrochlorinating α,β-dichloropropionic acid chloride at a temperature of from 60° to 120° C and a pressure of below 200 mm of Hg in the presence of a tertiary phosphine of the formula



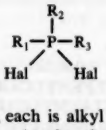
a quaternary phosphonium salt of the formula



a tertiary phosphine oxide, sulfide or imine of the formula



or a tertiary phosphine halide of the formula



wherein R_1, R_2 and R_3 each is alkyl of from 1 to 20 carbon atoms; cycloalkyl of from 4 to 8 carbon atoms; phenyl; phenalkyl of from 7 to 20 carbon atoms; said alkyl, cycloalkyl, phenyl or phenalkyl which is substituted;

R′ and R″ each being alkyl of from 1 to 20 carbon atoms, phenyl, phenalkyl of from 7 to 20 carbon atoms, or said alkyl, phenyl or phenalkyl which is substituted; wherein R_4 is hydrogen; alkyl of from 1 to 20 carbon atoms; cycloalkyl of from 4 to 8 carbon atoms; phenyl; phenalkyl of from 7 to 20 carbon atoms; or said alkyl, cycloalkyl, phenyl or phenalkyl which is substituted; wherein Y is a radical of an organic or inorganic acid; wherein Z is oxygen, sulfur, or NR_5, R_5 being alkyl of from 1 to 20 carbon atoms, cycloalkyl of from 4 to 8 carbon atoms, phenyl, phenalkyl of from 7 to 20 carbon atoms, or said alkyl, cycloalkyl, phenyl or phenalkyl which is substituted; wherein Hal is halogen; and wherein any two of R_1, R_2, R_3, R_4, and R_5 may together form an aliphatic chain or said chain interrupted by nitrogen, oxygen or sulfur.

4,066,691

PROCESS FOR THE PRODUCTION OF PURE DIGLYCOLIC ACID BY OXIDATION OF DIETHYLENE GLYCOL WITH NITRIC ACID

Manfred Schroeder, Marl, Germany, assignor to Chemische Werke Huels Aktiengesellschaft, Marl, Germany

Filed Sept. 8, 1976, Ser. No. 721,577
Claims priority, application Germany, Sept. 12, 1975, 2540726
Int. Cl.[2] C07C *51/26, 51/42*
U.S. Cl. 260—531 R 9 Claims

1. In a process for the production of pure diglycolic acid by oxidation of diethylene glycol with nitric acid in a reaction zone to form a reaction mixture containing diglycolic acid, the improvement comprising:

a. cooling at least a portion of the reaction mixture to −10° to +25° C. to crystallize a portion of the diglycolic acid therein;

b. separating the crystallized diglycolic acid from the cooled reaction mixture;

c. concentrating the resultant mother liquor at 5–530 mb. to a nitric acid concentration of 35–45% by weight;

d. cooling the concentrated mother liquor to −10° to +25° C. to crystallize a second portion of diglycolic acid;

e. separating the second portion of crystallized diglycolic acid from the cooled mother liquor; and

f. recycling the mother liquor to the reaction zone for oxidation of diethylene glycol with nitric acid.

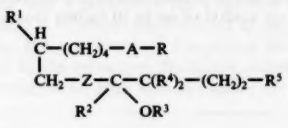
4,066,692

11,12-SECOPROSTAGLANDINS

Edward J. Cragoe, Jr.; John B. Bicking, and Robert L. Smith, all of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 571,038, April 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 389,901, Aug. 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 302,365, Oct. 30, 1972, abandoned. This application Mar. 22, 1976, Ser. No. 669,118
Int. Cl.[2] C07C *59/00*
U.S. Cl. 424—312 43 Claims

1. The compound having the following formula:



wherein

R is carboxy, a carboxy salt, or carboxy having the formula —COOY wherein Y is alkyl having 1–10 carbon atoms, 1-succinimidoethyl, 1-(pivaloyloxy)ethyl, 2-acetamidoethyl, or diloweralkylaminoloweralkyl;

A is ethylene, trimethylene, α-methylethylene, β-methylethylene, α,α-dimethylethylene, or β,β-dimethylethylene;

R^1 is formyl, acetyl, propionyl, acryloyl, hydroxyacetyl, 3-hydroxypropionyl, hydroxymethyl, 1-hydroxyethyl, 1,2-dihydroxyethyl, 1,3-dihydroxypropyl, or 1-hydroxy-1-methylethyl;

Z is methylene, ethylene, trimethylene, tetramethylene, vinylene, or ethynylene;

R^2 is independently hydrogen or methyl;

R^3 is hydrogen;

R^4 is selected independently from the group consisting of hydrogen and methyl;

R^5 is selected from the group consisting of hydrogen, lower alkyl of 1–4 carbon atoms either straight or branched (e.g., methyl, ethyl, propyl, isopropyl, butyl, tert-butyl), vinyl, and 2,2,2-trifluoroethyl.

4,066,693

PROCESS FOR THE PREPARATION OF UREA

Dirk J. Venderbos, Geleen, Netherlands, assignor to Stamicarbon, N.V., Geleen, Netherlands

Filed Aug. 29, 1972, Ser. No. 284,476
Claims priority, application Netherlands, Sept. 2, 1971, 7112061
Int. Cl.[2] C07C *126/00*
U.S. Cl. 260—555 A 7 Claims

1. In a process for preparing urea by reacting ammonia and carbon dioxide to form an ammonium carbamate intermediate product in a first reaction zone, and then converting ammonium carbamate into urea in an additional reaction zone at a higher pressure, partially expanding the resulting urea synthesis solution and subjecting the urea synthesis solution to a stripping treatment, and separating gases released in the stripping treatment and from the urea synthesis solution and recycling the separated gases to the first reaction zone, the improvement comprising conducting the formation of ammonium carbamate from ammonia and carbon dioxide in said first reaction zone at a pressure of 90 – 140 atmospheres and a temperature of about 150° to 173° C, thereafter partly converting the ammonium carbamate into urea in a second reaction zone at substantially the same pressure as said first reaction zone and a temperature of about 165 to 183° C until at least 40% of the equilibrium amount of urea has been formed, and thereafter converting ammonium carbamate present in the synthesis solution from the second reaction zone into additional urea in a third reaction zone at a pressure of at least 160 atmospheres and a temperature of about 190° to 220° C until at least 85% of the equilibrium amount of urea that can be obtained in this zone has been formed.

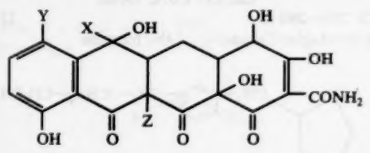
4,066,694

4-HYDROXY-4-DEDIMETHYLAMINO-TETRACYCLINES

Robert K. Blackwood, Gales Ferry, and Charles R. Stephens, Jr., East Lyme, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 114,038, Feb. 9, 1971, Pat. No. 3,824,285, which is a division of Ser. No. 667,357, Sept. 13, 1967, Pat. No. 3,622,627, which is a continuation-in-part of Ser. No. 360,435, April 16, 1964, abandoned, which is a continuation-in-part of Ser. No. 247,874, Dec. 28, 1962, abandoned. This application Jan. 22, 1973, Ser. No. 325,628
Int. Cl.[2] C07C *103/19*
U.S. Cl. 260—559 AT 3 Claims

1. A compound selected from the group consisting of



and the alkali metal and alkaline earth metal salts thereof wherein Y is hydrogen or chloro; Z is hydrogen, chloro or fluoro and X is methyl or hydrogen with the proviso that X is methyl when Z is hydrogen.

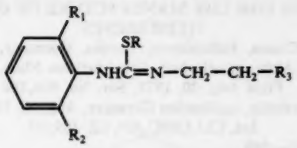
4,066,695

THIOUREA DERIVATIVES

Michael Robert Cohen, West Orange; Richard Wightman Kierstead, and Jefferson Wright Tilley, both of North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 677,106, April 15, 1976. This application Jan. 27, 1977, Ser. No. 763,189
Int. Cl.[2] C07C *127/26*
U.S. Cl. 260—564 E 3 Claims

1. A compound of the formula



wherein R is lower alkyl; R_1 and R_2, independently, are halogen; R_3 is amino;
and addition salts thereof with pharmaceutically acceptable acids.

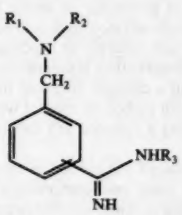
4,066,696

AROMATIC AMIDINES AS ANTIVIRAL AGENTS IN ANIMALS

Allen R. Kraska, East Lyme, and Rodney C. Schnur, Noank, both of, Conn. assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 708,180, July 23, 1976, Pat. No. 4,025,555. This application Feb. 18, 1977, Ser. No. 769,854
Int. Cl.[2] C07C *123/00*
U.S. Cl. 260—564 R 9 Claims

1. A compound of the structure



and the non-toxic acid addition salts thereof wherein
R_1 and R_2 are each alkyl of from twelve to twenty-four carbon atoms; and
R_3 is selected from the group consisting of
$-(CH_2)_nCH_2OH$,
$-(CH_2)_n-SO_3H$,
and
$-(CH_2)_nCF_3$,
wherein *n* is an integer of from one to six.

4,066,697

PROCESS FOR PREPARING TETRAMETHYLTHIURAM TETRASULFIDE

John P. Lawrence, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 28, 1976, Ser. No. 700,233
Int. Cl.[2] C07C *155/10*
U.S. Cl. 260—567 2 Claims

1. A process of preparing a sulfur donor for the sulfur vulcanization of rubber comprising oxidizing dimethylammonium dimethyl dithiocarbamate with hydrogen peroxide in the presence of carbon disulfide and sulfur in water with the proviso that no reactant is added subsequent to the addition of the hydrogen peroxide wherein the molar ratio of dimethylammonium dimethyl dithiocarbamate to carbon disulfide to hydrogen peroxide to sulfur is about 1:1–1.2:1–1.2:2–2.2.

4,066,698
PROCESS FOR THE MANUFACTURE OF ORGANIC HYDRAZINES

Hermann Clasen, Falkenstein, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 20, 1975, Ser. No. 606,108
Claims priority, application Germany, Aug. 22, 1974, 2440238
Int. Cl.[2] C07C *109/02, 109/04*
U.S. Cl. 260—569 13 Claims

1. A process for the preparation of organic hydrazines which comprises introducing a gaseous chloramine selected from the group consisting of chloramine, monoalkyl chloramine and dialkyl chloramine into a substantially anhydrous liquid phase organic amine selected from the group consisting of primary amine and secondary amine while intensely agitating the liquid phase during the addition of the chloramine and selectively reacting the chloramine with the organic amine to form the corresponding organic hydrazine.

4,066,699
PROCESS FOR THE HYDROGENATION OF NITRATED PARAFFINS USING A PALLADIUM ON CARBON CATALYST CHARACTERIZED BY A LOW ASH AND A LOW HALIDE CONTENT

Robert M. Suggitt, Wappingers Falls; Joseph H. Coone, Jr., Fishkill, and Walter C. Gates, Jr., Newburgh, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,378
Int. Cl.[2] C07C *85/11;* B01J *21/18*
U.S. Cl. 260—583 R 14 Claims

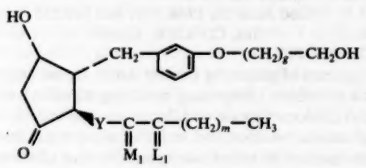
1. The method of preparing an amine by hydrogenating a corresponding charge nitrated hydrocarbon which comprises
hydrogenating said charge at hydrogenation conditions including hydrogenation temperature of 100°–450° F in the presence of a catalyst prepared by
leaching a high ash carbon in contact with a hydrohalic acid thereby forming a reduced ash carbon containing halide values;
leaching said reduced ash carbon in contact with a solution containing at least one composition selected from the group consisting of water-soluble organic carboxylic acids and ammonium salts thereof thereby forming a reduced ash carbon containing decreased halide values; and
depositing palladium on said reduced ash carbon containing decreased halide values thereby forming the catalyst;
thereby forming a product stream containing hydrogenated product; and
recovering said product stream containing said hydrogenated product.

4,066,700
2-DECARBOXY-2-HYDROXYMETHYL-3,7-INTER-m-PHENYLENE-3-OXA-PGD$_1$ COMPOUNDS

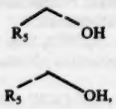
Norman A. Neslon, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,363, Jan. 8, 1976, Pat. No. 4,028,419.
This application Mar. 17, 1977, Ser. No. 778,771
Int. Cl.[2] C07C *49/84*
U.S. Cl. 260—590 C 22 Claims

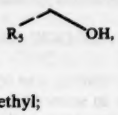
1. A prostaglandin analog of the formula



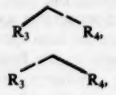
wherein
Y is trans—CH=CH—;
wherein M_1 is



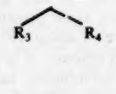
or



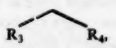
wherein
R_5 is hydrogen or methyl;
wherein
L_1 is



or a mixture of



and



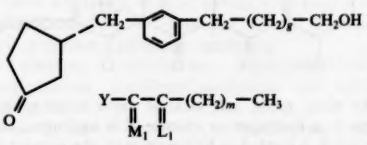
wherein
R_3 and R_4 are hydrogen, methyl, or fluoro, the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein g is one, 2, or 3; and
wherein m is one to 5, inclusive.

4,066,701
2-DECARBOXY-2-HYDROXYMETHYL-3,7-INTER-M-PHENYLENE-9-DIOXY-PGD$_1$ COMPOUNDS

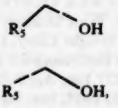
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,363, Jan. 8, 1976, Pat. No. 4,028,419.
This application Mar. 17, 1977, Ser. No. 778,772
Int. Cl.[2] C07C *49/82*
U.S. Cl. 260—590 C 22 Claims

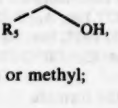
1. A prostaglandin analog of the formula



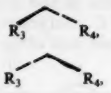
wherein Y is trans—CH=CH—;
wherein M_1 is



or



wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of

and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein g is one, 2, or 3; and
wherein m is one to 5, inclusive.

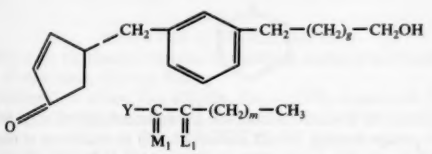
4,066,702

2-DECARBOXY-2-HYDROXYMETHYL-3,7-INTER-M-PHENYLENE-9-DEOXY-9,10-DIDEHYDRO-PGH$_1$ CPOMPOUNDS

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,363, Jan. 8, 1976, Pat. No. 4,028,419. This application Mar. 17, 1977, Ser. No. 778,775
Int. Cl.^{2} C07C *49/82*
U.S. Cl. 260—590 C **22 Claims**

1. A prostaglandin analog of the formula



wherein Y is trans —CH=CH—;
wherein M_1 is

or

wherein R_5 is hydrogen or methyl;
wherein L_1 is

or a mixture of

and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein g is 1, 2, or 3; and
wherein m is 1 to 5, inclusive.

4,066,703

METHOD FOR PRODUCING AROMATIC HYDROXIDE AND ALIPHATIC KETONE

Tsutomu Shintani; Azuhiro Ozeki; Haruo Kunihiro, and Kosuke Shigehiro, all of Oita, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 5, 1976, Ser. No. 729,850
Claims priority, application Japan, Oct. 13, 1975, 50-123410; Jan. 21, 1976, 51-6251
Int. Cl.^{2} C07C *45/00, 37/08*
U.S. Cl. 260—592 **1 Claim**

1. In the method for producing an aromatic hydroxide and an aliphatic ketone by cleaving an oxidation product containing a hydroperoxide of at least one secondary alkyl substituted aromatic hydrocarbon selected from the group consisting of cumene, isopropyl-sec.-butylbenzene, cyclohexylbenzene, cymene, isopropylxylene, ethylisopropylbenzene, diisopropylbenzene, isopropyl-tertbutylbenzene, isopropylnaphthalene, isopropylbiphenyl and isomers thereof, in the presence of an acid catalyst selected from the group consisting of sulfuric acid, sulfuric acid anhydride, perchloric acid, sulfur dioxide, aromatic sulfonyl chlorides and trichloromethanesulfonic acid, at a temperature of about 50° to 80° C, the improvement which comprises incorporating at least one antioxidant selected from the group consisting of phenol antioxidants and amine antioxidants into the oxidation product in an amount of at least 0.001% by weight based on the weight of the oxidation product, prior to or during the cleavage,

the phenol antioxidant being 2,6-di-tert.butyl-4-methylphenol, 2,2′-methylene-bis-(6-tert.butyl-4-methylphenol), 4,4′-thiobis-(6-tert.butyl-3-methylphenol), 4,4′-butylidenebis(6-tert.butyl-3-methylphenol), styrenated phenols or 1,1-bis-(4-hydroxyphenol)-cyclohexane, and the amine oxidant being phenyl-β-naphthylamine, N,N′-di-β-naphthyl-p-phenylenediamine, N,N′-diphenyl-p-phenylenediamine, 2,2,4-trimethyl-1,2-dihydroquinoline polymer or N-phenyl-N′-diisopropyl-p-phenylenediamine.

4,066,704

CATALYTIC OXIDATION

Norman Harris, and David Naden, both of Stockton-on-Tees, England, assignors to The Power-Gas Corporation Limited, Teesside, England

Filed Dec. 28, 1970, Ser. No. 102,067
Claims priority, application United Kingdom, Mar. 24, 1970, 14072/70; July 16, 1970, 34508/70; July 20, 1970, 35500/70; Oct. 22, 1970, 50131/70
Int. Cl.^{2} C07C *45/02;* B01J *23/00*
U.S. Cl. 260—604 R **2 Claims**

1. A process for the catalytic oxidation or oxidative dehydrogenation of an alkane of 3 to 8 carbon atoms to an aldehyde, in which a feed gas comprising oxygen and the alkane in vapor phase is passed in the absence of ammonia and at a temperature in the range of 350° to 569° C. over a solid oxidation catalyst comprising one of the elements Sb, Mo, W, V and Bi; at least one other of those elements and/or at least one of the elements

Fe, Sn, U, Ti, Pb, Co, Cu and P; and oxygen, and in which the partial pressure of the alkane in the feed gas is in excess of 0.70 atmosphere absolute and the alkane constitutes more than 70% of the feed gas by volume.

4,066,705
POLYBENZIMIDAZOLE FIBER SUPPORTED CATALYST

O. Richard Hughes, Chatham, N.J., assignor to Celanese Corporation, New York, N.Y.

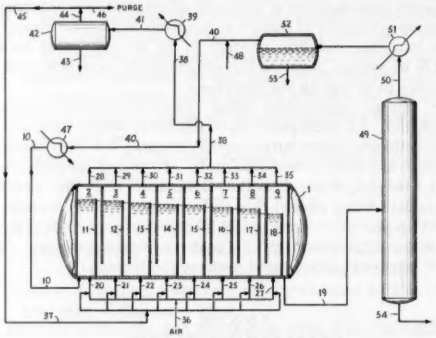
Filed Oct. 22, 1975, Ser. No. 624,798
Int. Cl.[2] C07C *45/08*
U.S. Cl. 260—604 HF **4 Claims**

1. In a hydroformylation process in which an olefin of from 2 to 20 carbon atoms is reacted with carbon monoxide and hydrogen under hydroformylation conditions wherein the temperature varies from about 20° to about 200° C and the pressure varies from about 1 to about 50,000 psi to yield a product selected from the group consisting of aldehyde, alcohol and mixtures thereof; the improvement comprising carrying out the reaction in the presence of an insolubilized polybenzimidazole fiber supported rhodium catalyst wherein a rhodium carbonyl complex of the type $[Rh(CO)_nX_y]_2^a$, where a may vary from 0 to -2, n may vary from 1 to 2, y may vary from 1 to 2, and X is a member selected from the group consisting essentially of a halogen, carboxylate, nitrate, thiocyanate and sulfate, forms a polybenzimidazole complex with the benzimidazole units of the polybenzimidazole fiber surface, said benzimidazole units acting as donor ligands for the rhodium carbonyl complex.

4,066,706
PREPARATION OF ETHYLBENZENE HYDROPEROXIDE

John P. Schmidt, Princeton, N.J., assignor to Halcon International, Inc., New York, N.Y.

Filed Apr. 21, 1975, Ser. No. 569,734
Int. Cl.[2] C07C *179/02*
U.S. Cl. 260—610 B **5 Claims**



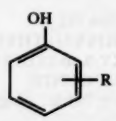
1. A process for the preparation of ethylbenzene hydroperoxide by the liquid-phase molecular oxygen oxidation of ethylbenzene in a reaction zone wherein liquid flows from an upstream portion to a downstream portion of said reaction zone which comprises the steps of introducing liquid ethylbenzene into the upstream portion of said reaction zone, introducing air into said reaction zone for direct contact of said molecular oxygen with said ethylbenzene in said zone, removing vapors comprising non-condensible inert gases from said reaction zone, cooling said vapors to separate condensible components from said vapors, recycling said cooled non-condensible gases to said reaction zone, and removing a liquid stream containing product ethylbenzene hydroperoxide from the downstream portion of said reaction zone, said zone being under a pressure of about 1 psig to about 1000 psig and said cooled recycling noncondensible gases being introduced into said zone at a rate to control the temperature of said zone within the range of about 100° to about 165° C., said temperature decreasing from the upstream portion of said zone to the downstream portion of said zone.

4,066,707
METHOD FOR MANUFACTURE OF DIPHENOLS AND MONOALKYL ETHERS OF DIPHENOLS

Kiyoshi Nakatani, Tokyo; Juichi Imamura, Chofu; Toshiyuki Ichikawa, Tokyo; Kouichi Takeuchi, Yokohama, and Kenji Kotaka, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology and Mitsui Toatsu Chemicals, Incorporated, both of Tokyo, Japan

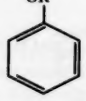
Filed Aug. 25, 1976, Ser. No. 717,534
Claims priority, application Japan, Aug. 28, 1975, 50-104451
Int. Cl.[2] C07C *37/00*
U.S. Cl. 260—613 R **6 Claims**

1. A method for the manufacture of at least one reaction product selected from the group consisting of diphenol and an ether of diphenol having the hydrogen atom of one hydroxy group thereof substituted with one member selected from the group consisting of alkyl and aryl groups of 1 to 12 carbon atoms, which method comprises subjecting at least one compound as the starting material selected from the group consisting of the compounds of the generic formula:



(I)

(wherein, R is selected from the group consisting of a hydrogen atom and alkyl groups having 1 to 12 carbon atoms) and the compounds of the generic formula:



(II)

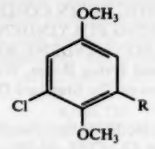
(wherein, R' is selected from the group consisting of alkyl and aryl groups having 1 to 12 carbon atoms) to oxidation at temperatures in the range of from 30° to 150° C for a period of from 10 to 200 minutes with at least one organic per-acid selected from the group consisting of performic acid, peracetic acid, perpropionic acid, perbutyric acid, perisobutyric acid, permonochloroacetic acid, pertrichloroacetic acid and perbenzoic acid in an amount corresponding to 0.01 to 0.3 mol based on the compound as the starting material in the presence of at least one catalyst selected from the group consisting of acetyl acetone and acetonyl acetone in an amount corresponding to 0.001 to 2% by weight based on the compound as the starting material.

4,066,708
PROCESS FOR PREPARING CHLORINATED HYDROQUINONE DIMETHYL ETHERS

Hans Millauer, Eschborn, Taunus, and Rudolf Pistorius, Wehrheim, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

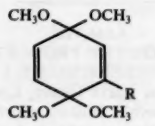
Filed Sept. 15, 1976, Ser. No. 723,486
Int. Cl.[2] C07C *41/00*
U.S. Cl. 260—613 D **7 Claims**

1. A process for preparing chlorinated hydroquinone dimethyl ethers of the formula



I,

wherein R is hydrogen or chlorine, from quinoid starting compounds which comprises mixing p-benzoquinone tetramethyl diketals of the formula



II,

wherein R is defined as in the formula I, with a solution of an excess of hydrogen chloride in an aprotic solvent, at a temperature from about −50° to +50° C and isolating the products of the formula I thus formed.

4,066,709

α-ETHYNY BENZHYDROLS

Edit Toth; Jozsef Törley; Sandor Görög; Laszlo Szporny; Eva Palosi, and Szabolcs Szeberenyi, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Division of Ser. No. 495,846, Aug. 8, 1974, Pat. No. 3,965,179. This application Nov. 10, 1975, Ser. No. 630,511
Claims priority, application Hungary, Aug. 15, 1973, RI 520
Int. Cl.[2] C07C *31/16*
U.S. Cl. 260—618 B **2 Claims**

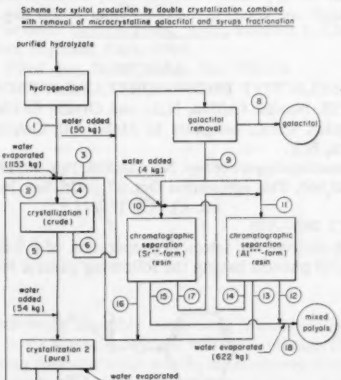
1. 2,5-dimethyl-α-ethynyl-benzhydrol.

4,066,710

UNSATURATED ALCOHOL

Paul Albert Ochsner, Geneva, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Continuation of Ser. No. 430,354, Jan. 2, 1974, abandoned. This application Aug. 19, 1976, Ser. No. 715,963
Int. Cl.[2] C07C *33/02*
U.S. Cl. 260—631.5 **1 Claim**


Scheme for xylitol production by double crystallization combined with removal of microcrystalline galactitol and syrups fractionation
purified hydrolyzate
hydrogenation
water added (50 kg)
water evaporated (153 kg)
crystallization I (crude)
galactitol removal
galactitol
water added (4 kg)
chromatographic separation (Sr++-form) resin
chromatographic separation (Al+++-form) resin
water added (54 kg)
mixed polyols
crystallization 2 (pure)
water evaporated (622 kg)
water evaporated (51 kg)
water added (17 kg)
xylitol
Yield 96% of xylitol
Water evaporated 25 kg/kg xylitol
Material balance in Table II
Water amounts correspond to the material balance in Table II

1. 2,7-Dimethyl-5,7-octadien-2-ol.

4,066,711

METHOD FOR RECOVERING XYLITOL

Asko J. Melaja; Jouko J. Virtanen, and Heikki O. Heikkila, all of Kantvik, Finland, assignors to Suomen Sokeri Osakeyhtio (Finnish Sugar Company), Helsinki, Finland

Filed Mar. 15, 1976, Ser. No. 666,584
Int. Cl.[2] C07C *29/24*
U.S. Cl. 260—637 R **10 Claims**

1. A method for obtaining xylitol crystals of pharmaceutical grade from an aqueous solution of a mixture of polyols including xylitol which comprises the steps of

a. subjecting said solution to a crude xylitol crystallization step to crystallize a major portion of the xylitol therein while leaving a mother liquor,

b. removing the crude crystals from the mother liquor,

c. recrystallizing the xylitol by dissolving the crude crystals in water and crystallizing them to provide crystals of high purity, while leaving a mother liquor, and

d. recovering residual xylitol from the mother liquors from the crystallization and recrystallization steps by subjecting at least a portion of the mother liquors to a chromatographic fractionation using at least two columns containing sulfonated polystyrene cation exchange resins crosscoupled with di-vinyl benzene, one of said columns containing the resin in an alkaline earth form and the other of said columns containing the resin in an Al^{+++} or Fe^{+++} form.

4,066,712

REFORMING PROCESS USING CHROMIUM TRIOXIDE-GRAPHITE INTERCALATION CATALYST

Jesse R. Harris, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 25, 1975, Ser. No. 616,720
Int. Cl.[2] C07C *5/22, 15/00*
U.S. Cl. 260—668 D **9 Claims**

1. A process for reforming nonaromatic hydrocarbons to produce a product having an increased aromatic content which comprises contacting a nonaromatic hydrocarbon-containing feed under reforming conditions of temperature and pressure in the presence of a catalyst consisting of a molecular chromium trioxide-graphite intercalation complex to convert the nonaromatic hydrocarbons present in the feed to aromatics, and withdrawing a reformate rich in aromatics, said catalyst having been prepared by heating a mixture of chromium trioxide and graphite at an elevated temperature and for a period of time sufficient to form said complex having a weight ratio of chromium trioxide to graphite of about 0.01:1 to about 2.5:1.

4,066,713

PROCESS FOR THE ADDITION OF ORGANIC ACIDS TO ACETYLENIC COMPOUNDS CONTAINED IN INORGANIC OR ORGANIC HYDROCARBON STREAMS

Rocco Faraci; Carlo Rescalli, and Stefano Catini, all of San Donato (Milan), Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Filed July 6, 1976, Ser. No. 703,121
Claims priority, application Italy, July 8, 1975, 25171/75
Int. Cl.[2] C07C *11/02*
U.S. Cl. 260—677 A **15 Claims**

1. A method for the removal of acetylenic compounds contained in inorganic or organic hydrocarbon streams, characterized in that an organic acid is added to said acetylenic compounds in the presence of an acidic ion-exchange resin, the acidic groups of which have been totally exchanged with both mercuric ions and ions of alkali metal or alkaline earth metals.

4,066,714

MANUFACTURE OF LIGHT OLEFINS

Paul G. Rodewald, Rocky Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 8, 1975, Ser. No. 638,403
Int. Cl.[2] C07C *1/20, 11/02*
U.S. Cl. 260—682 7 Claims

1. A process for producing hydrocarbons which comprises contacting, under conversion conditions, a charge consisting essentially of one or more lower monohydric alcohols having up to four carbon atoms, the ethers derived therefrom, or mixtures of said alcohols and ethers with a catalyst comprising a crystalline aluminosilicate zeolite having a crystal size within the approximate range of 1 to 2 microns, a silica to alumina ratio of at least about 12, a constraint index within the approximate range of 1 to 12 and containing, in cationic form, between about 0.01 and about 1.9 milliequivalents per gram of a metal selected from the group consisting of cesium and barium.

4,066,715

METHOD FOR PREPARATION OF OLEFIN OLIGOMER

Hiroshi Isa; Toshiyuki Ukigai, both of Yachiyo; Anri Tominaga, Tokyo, and Michito Sato, Yokohama, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1976, Ser. No. 675,238
Claims priority, application Japan, Apr. 16, 1975, 50-45591
The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.
Int. Cl.[2] C07C *3/18*
U.S. Cl. 260—683.15 B 6 Claims

1. A method or preparing an olefin oligomer, which comprises polymerizing at a temperature of from 50° to 150° C, an olefin or a mixture of olefins having 6 or more carbon atoms, in the presence of a catalyst mixture of (a) a polyhydric alcohol derivative obtained by replacing the hydrogen atoms of all the hydroxyl groups of the polyhydric alcohol by either acyl groups exclusively or by acyl groups and alkyl groups, both of said groups having 1 to 20 carbon atoms, (b) an aluminum halide in an amount of 1.1 to 2.8 mole per one ester bond or ether bond of said polyhydric alcohol derivative, and (c) metallic aluminum powder; and recovering an olefin oligomer from the polymerization reaction mixture.

4,066,716

ALKYLATION PROCESS OF ALKANES WITH OLEFINS UTILIZING CHLORIDED ALUMINA CATALYST

Sheldon Herbstman, Spring Valley; Allen N. Webb, and John H. Estes, both of Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Aug. 14, 1975, Ser. No. 604,586
Int. Cl.[2] C07C *3/52*
U.S. Cl. 260—683.47 9 Claims

1. A process for the alkylation of alkanes with olefins which comprises contacting an alkane and an olefin under alkylation conditions with an improved catalyst consisting essentially of chlorine and alumina, said improved catalyst prepared by reacting a catalytically active chlorided alumina composite comprising from about 3.0 to 15.0 weight percent chlorine with aluminum chloride at a temperature of between 300° and 650° F. wherein 100 parts by weight of said composite is contacted with from about 2 to 40 parts by weight of vaporized aluminum chloride thereby further chlorinating said catalyst's surface with an additional 2 to 15 weight percent chlorine without the deposition of aluminum chloride.

4,066,717

THERMOPLASTIC RESIN COMPOSITIONS COMPRISING POLYINDENE OR COUMARONE-INDENE RESIN

George S. Li, Aurora, and Irving Rosen, Warrensville Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 24, 1975, Ser. No. 644,122
Int. Cl.[2] C08L *25/06*
U.S. Cl. 260—874 2 Claims

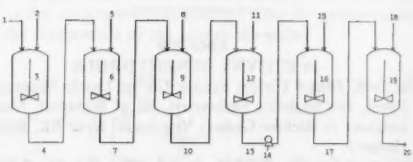
1. A composition having improved physical properties comprising a blend of (A) 100 parts by weight of polystyrene and (B) from 1 to 50 parts by weight of polyindene.

4,066,718

PROCESS FOR THE PRODUCTION OF ETHYLENE-PROPYLENE BLOCK COPOLYMERS

Shinichi Saito, Ichihara; Asaya Okaue, Kimitsu; Kazuo Baba, and Shigeo Tanaka, both of Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 8, 1976, Ser. No. 730,742
Claims priority, application Japan, Oct. 13, 1975, 50-123411
Int. Cl.[2] C08F *297/08*
U.S. Cl. 260—878 B 5 Claims



1. A method for the continuous production of crystalline ethylene-propylene block copolymers containing propylene as the major component in a slurry-phase by homopolymerizing propylene and then copolymerizing ethylene and propylene in the presence of an inert hydrocarbon solvent and a stereoregular polymerization catalyst in polymerization vessels connected in series, which comprises hompolymerizing propylene in three polymerization vessels, wherein the inner pressure of the vessels is decreased in order to make the inner-pressure difference between each consecutive two vessels from 1 to 3 kg/cm^2, and then copolymerizing ethylene and propylene in at least two polymerization vessels, the resulting slurry being transferred from one vessel to the next vessel by the inner-pressure difference between the vessels in the homopolymerization step and being pressure-transferred by means of a slurry pump to at least one vessel in the copolymerization step.

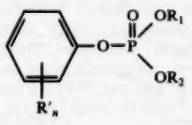
4,066,719

SELECTIVE PHOSPHORYLATION PROCESS

Roger P. Napier, Califon, N.J., and Orville L. Chapman, Los Angeles, Calif., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 548,508, Feb. 10, 1975, Pat. No. 4,003,966. This application Oct. 27, 1976, Ser. No. 736,020
Int. Cl.[2] C07F *9/12*
U.S. Cl. 260—970 8 Claims

1. A process for selective preparation of 0,0-dialkyl phosphates of phenols having the following general formula:



wherein R′ is alkylmercapto and n is 1–5; R_1 is alkyl of 1–12 carbon atoms; and R_2 is alkyl of 1–12 carbon atoms, comprising

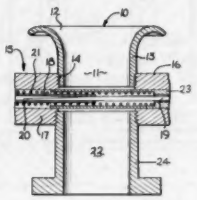
reacting, from about room temperature to the boiling point of the reactants, a phenolic compound with dimethyl disulfide and a trialkyl phosphite each alkyl grup thereof having from 1-12 carbon atoms, said phenolic compound being a phenol containing a ring substituent that is mercapto.

4,066,720

CARBURETOR AIR INTAKE VELOCITY STACK

Efton T. Carter, 2605 Irwin St., Lake Isabella, Calif. 93240

Filed Aug. 30, 1973, Ser. No. 392,883
Int. Cl.[2] F02M *9/06*
U.S. Cl. 261—44 R **2 Claims**



1. A carburetor air intake velocity stack engageable with a carburetor inlet comprising:

a. a cylindrical throat section having first and second ends, said throat section having a uniform, interior diameter, the first end thereof being adapted to be coupled to the carburetor; and

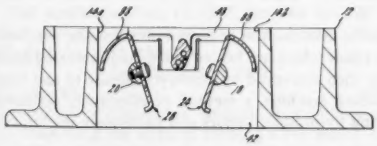
b. a terminus section integrally depending from the second end of said throat section and having an interior surface contiguous with the interior diameter of said throat section, said terminus section having first and second ends, the first end being contiguous with the second end of said throat section, the surface of said terminus section intermediate said first and second ends thereof being a surface of revolution about the axis of symmetry of said cylindrical throat section, said surface of revolution being defined by a curve having a constant first derivative of the radius of curvature, said terminus section intermediate said second and first ends thereof being defined by a radius of curvature commencing at said second end which radius of curvature increases at a constant, linear rate, whereby air drawn into said terminus is induced to flow in a substantially laminar manner.

4,066,721

THROTTLE BODY HAVING A NOVEL THROTTLE BLADE

Kenneth A. Graham, Beverly Hills, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Aug. 30, 1976, Ser. No. 719,206
Int. Cl.[2] F02M *17/40*
U.S. Cl. 261—62 **3 Claims**



1. A throttle body assembly comprising in combination:

a throttle body having a straight induction passage therein comprising four flat walls which, in transverse cross section perpendicular to the axis of the passage, define a rectangular cross section for the passage;

a pair of shafts extending across said passage, each shaft being journaled for rotation on the throttle body about its own axis, one of said shafts being disposed between the passage axis and one wall of said passage, the other shaft being disposed between the passage axis and the opposite wall;

a throttle blade disposed within said passage and affixed to said one shaft in approximate balance thereon, said throttle blade being formed from sheet metal stock of uniform thickness into a shape comprising a flat, rectangular main blade section which, in idle position, extends from said one wall partially across said passage toward said opposite wall but stops short of the other shaft and which fits closely between the remaining two walls of said passage;

a second throttle blade identical to said first throttle blade disposed within said passage and affixed to said other shaft in approximate balance thereon, said second throttle blade also being formed from sheet metal stock of uniform thickness into a shape comprising a flat, rectangular main blade section which, in idle position, extends from said other wall partially across said passage toward said one wall and cooperates with the first throttle blade to define an opening therebetween;

means for rotating said shafts so that the juxtaposed edges of the main blade sections of said blades are displaced from idle position in the downstream direction to increase the area of said opening;

said first throttle blade comprising an auxiliary blade section extending from the edge of its main blade section opposite the edge thereof which is juxtaposed to said second blade, said auxiliary blade section fitting closely between said two remaining walls and presenting a curved confronting surface to said one wall, which when viewed in a transverse cross section perpendicular to the axis of the shaft to which it is attached, is disposed on an at least approximately circular arc which is at least approximately concentric with the axis of the corresponding shaft and has a radius of curvature smaller than the minimum distance from the axis of the corresponding shaft to said one wall, and which is so disposed relative to said one wall as to preclude the intrusion of any appreciable induction flow between said first throttle blade and said one wall as the blades are displaced from idle position over an initial range of operative positions, but which increasingly separates from said one wall as the blades are displaced beyond said initial range to permit induction air to pass between said first throttle blade and said one wall; and

said second throttle blade comprising an auxiliary blade section extending from the edge of its main blade section opposite the edge thereof which is juxtaposed to said first blade, said auxiliary blade section of said second blade fitting closely between said two remaining walls and presenting a curved confronting surface to said other wall, which when viewed in a transverse cross section perpendicular to the axis of the shaft to which it is attached is disposed on an at least approximately circular arc which is at least approximately concentric with the axis of the corresponding shaft and has a radius of curvature smaller than the minimum distance from the axis of the corresponding shaft to said other wall, and which is so disposed relative to said other wall as to preclude the intrusion of any appreciable induction flow between the second throttle blade and said other wall as the blades are displaced from idle position over said initial range of operative positions, but which increasingly separates from said other wall as the blades are displaced beyond said initial range to permit induction air to pass between said second throttle blade and said other wall;

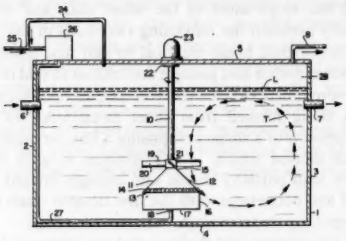
each of said throttle blades being of uniform cross sectional shape throughout its extent along the length of the axis of the shaft to which it is attached, as viewed in perpendicular cross section to the axis of the corresponding shaft.

4,066,722

APPARATUS FOR SPARGING GAS INTO LIQUID

John Joseph Pietruszewski, Buffalo; Carl Scaccia, Depew, and Ralph James Wagner, Tonawanda, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 21, 1976, Ser. No. 688,739
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—87 **14 Claims**



1. Apparatus for sparging gas into liquid comprising:
a. A vertically oriented rotatable shaft;
b. A hollow rotatable bell having a generally downwardly diverging symmetrical shape about a central vertical axis, connected to the lower end of the shaft for rotation therewith, with the outer wall surface of the bell including a circumferentially extending jet flow surface portion, with a plurality of circumferentially distributed gas flow wall openings in the base part of the jet flow surface wall portion, and an imperforate wall surface sealing segment joined to the base part of the jet flow surface wall portion to form a liquid seal for the gas flow wall openings, the jet flow surface portion of the wall being imperforate along its upper part and having a surface profile of continuous positive curvature from the base part thereof containing said gas flow wall openings to the upper part thereof with a base angle β of between about 0° and about 60° and an apex angle α of between about 0° and about 65° wherein β is the angle formed in a radial plane between a tangent to the base part surface portion and a horizontal radius line extending from the bell axis to the point of tangency and α is the angle formed in a radial plane between a tangent to the upper part surface portion and the bell axis;
c. Axial flow pumping means disposed about the rotatable bell aligned for flowing liquid downwardly over the jet flow surface portion of the bell wall from the upper part to the base part thereof, to provide a high shear jet flow of liquid over the gas flow wall openings; and
d. Means for introducing pressurized gas into the interior of the rotatable bell for discharge therefrom through the gas flow wall openings into the high shear jet flow of liquid, to provide a localized dispersion of the discharged gas in the jet flow liquid for gas-liquid contacting and bulk mixing thereof.

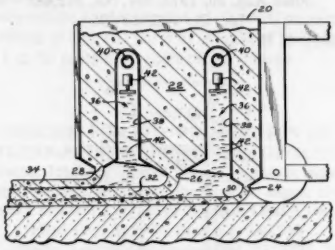
4,066,723

METHOD AND APPARATUS FOR MAKING FIBROUS CONCRETE

Ralph J. King, Dunlap; William H. Belke, Peoria, and William E. Dearlove, Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 19, 1976, Ser. No. 668,352
Int. Cl.[2] E01C *11/18*
U.S. Cl. 264—34 **5 Claims**

1. A method of producing a sheet-like, fiber reinforced concrete structure of a desired thickness comprising the steps of:
a. extruding a sheet of concrete substantially free of reinforcing fibers on a support;
b. thereafter distributing from above the sheet an effective amount of staple reinforcing fibers on the surface of the sheet remote from the support resulting from step (a) before the sheet has set up such that the fibers lie essentially in the plane of said surface;
c. extruding a further sheet of concrete substantially free of reinforcing fibers on said surface of the sheet and the reinforcing fibers received thereon before the concrete sheet has set up;
d. repeating steps (b) and (c) until the desired thickness of the sheet-like structure is approached and before the concrete sheet(s) has set up;
e. extruding a further sheet of substantially fiber-free concrete over the structure resulting from step (d) before the concrete sheets have set up to achieve said desired thickness; and
f. varying the amount of staple fibers distributed during each performance of step (b) to obtain a predetermined fiber distribution from sheet to sheet.

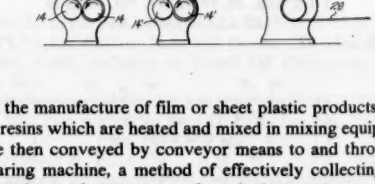


4,066,724

METHOD FOR COLLECTING INDUSTRIAL VAPORS AND PARTICULATE MATTER

Shigeo Matsubara, Yokohama, Japan, assignor to Kohkoku U.S.A., Inc., Everett, Wash.

Division of Ser. No. 602,231, Aug. 6, 1975, Pat. No. 3,999,911. This application Oct. 7, 1976, Ser. No. 730,603
Claims priority, application Japan, Dec. 25, 1974, 49-147968
Int. Cl.[2] B03C *3/00*; B29D *7/14*
U.S. Cl. 264—39 **1 Claim**



1. In the manufacture of film or sheet plastic products from plastic resins which are heated and mixed in mixing equipment and are then conveyed by conveyor means to and through a calendaring machine, a method of effectively collecting and removing by-product vapors and particulate matter, comprising:
positioning hood means over at least a portion of the heat and mixing equipment, the conveying means and the calendaring machine;
providing walls of an electrically statically charged clear plastic sheet material which are connected to their tops about border portions of the hood means and which depend therefrom, so as to form vapor collecting enclosures for the mixing and heating equipment, the conveying means and the calendaring machine;

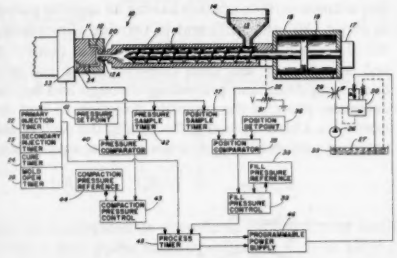
providing duct means extending from the hood means;
providing fan means connected to the duct means for drawing vapors upwardly from said enclosures, through the hood means and then through the duct means, including controlling the rate of vapor removal by the fan means to in this manner maintain the temperature within the enclosures at the level required for production of a quality final product; and
collecting the particulate matter on said material by electrostatic attraction, and replacing the clear plastic sheet material once it has reached its capacity of collected particulate matter.

4,066,725

INJECTION MOLDING CONTROL METHOD

Jon E. Boettner, Owens Township, Winnebago County, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Dec. 3, 1973, Ser. No. 421,115
Int. Cl.[2] B29G *3/00*
U.S. Cl. 264—40.5 **7 Claims**



1. A method for control of a process for injecting into and curing in a mold cavity a plasticized material comprising the steps of sensing at a predetermined time after initiation of injection the position of a ram injecting said plasticized material into the cavity, determining the deviation of said sensed position from a predetermined setpoint position, adjusting a fill pressure in a manner to compensate for said position deviation, and compacting the plasticized material in said cavity under an independent compaction pressure, wherein said compacting step comprises sensing the mold pressure in said cavity at a second predetermined time after initiation of injection and after completion of filling of the cavity, determining the deviation of said sensed mold pressure from a predetermined setpoint pressure, and adjusting said compaction pressure in a manner to compensate for the pressure deviation.

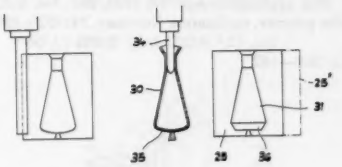
4,066,726

MULTI-STAGE METHOD OF BLOW MOLDING HOLLOW SHAPED ARTICLES

Gottfried Mehnert, Messelstr. 251, Berlin 33, Germany

Continuation of Ser. No. 415,806, Nov. 14, 1973, abandoned. This application Oct. 14, 1975, Ser. No. 622,020
Claims priority, application Germany, Nov. 18, 1972, 2256683; Oct. 30, 1973, 2354214
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—89 **3 Claims**

1. A method of converting parisons into hollow shaped articles, comprising the steps of forming a succession of parisons including extruding plasticized synthetic plastic material substantially vertically downwardly at a first station; transferring parisons to a second station which is laterally offset from said first station, including moving a first multisection mold whose sections are movable between open and closed positions from said second to said first station while said sections are held in open positions, closing said sections around the parison at said first station, separating the thus confined parison from material which is being extruded, and moving the first mold to said second station while said sections remain in closed positions; introducing a hollow blowing mandrel into the mold at said second station and converting the confined parison into a hollow preform by introducing a gaseous blowing medium into the parison through the hollow mandrel; moving said sections to open positions and thereupon moving the mold to said first station for reception of a fresh parison while maintaining said mandrel at said second station with the preform suspended thereon; confining the preform on said mandrel at said second station in a second multi-section mold whose sections are movable between open and closed positions independently of the sections of said first mold so that the length of the interval of confinement of the preform in said second mold can deviate from the length of the interval of confinement of the



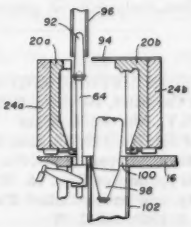
parison in said first mold, including moving the sections of said second mold to open positions at a third station which is laterally offset from said second station; moving the second mold to said second station so that the preform on said mandrel is received between the sections of said second mold and moving the sections of said second mold to closed positions; introducing into the thus confined preform a gaseous blowing medium through said mandrel to convert the preform into a shaped article; withdrawing the mandrel from the second mold at said second station while said sections of said second mold remain in closed positions; and ejecting the article from the second mold, including moving the sections of said second mold to open positions at said third station.

4,066,727

METHOD FOR CONTINUOUS STRETCH-BLOW MOLDING

Joseph R. Reilly, Naugatuck, and Leonard J. Witkowski, Windsor Locks, both of Conn., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 642,936, Dec. 22, 1975, Pat. No. 3,977,822, and a continuation-in-part of Ser. No. 558,841, March 17, 1975, abandoned. This application June 14, 1976, Ser. No. 695,943
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—94 **7 Claims**



1. In the process of blow molding articles from preforms which includes the steps of:
positioning such preforms within cavities of continuously moving blow molds;
distending such preforms within the moving molds to form the articles; and
discharging the articles from the still-moving molds at an eject station prior to charging with additional preforms;

the improvement in said process which comprises:

holding a preform temporarily at and moving with each such moving mold while an article is being formed in the cavity of such mold from a prior preform; and

charging said preform directly to said mold during or after discharge of an article formed from a prior preform from such mold at the eject station.

4,066,728

METHOD FOR SPECIMEN PREPARATION

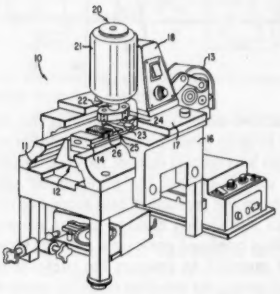
Werner Behme, Walldorf, and Manfred Berleth, Eppelheim, both of Germany, assignors to R. Jung AG Fabrik fur Prazisionsapparate, Heidelberg, Germany

Continuation of Ser. No. 453,142, March 20, 1974, abandoned. This application Apr. 19, 1976, Ser. No. 678,273

Claims priority, application Germany, Mar. 20, 1973, 2314029

Int. Cl.[2] B23C *3/12*; B28B *11/08*

U.S. Cl. 264—162 **2 Claims**



1. A method of preparing, in a microtome having a rotary milling cutter, a specimen composed of materials exhibiting differential hardness through a cross-section thereof the achieve a mirror-smooth and roughness-free specimen surface for viewing in reflected illumination such as in a scanning electron microscope comprising:

imbedding said specimen in a casting resin medium;

mounting said specimen on a specimen slide means in said microtome;

advancing said specimen along said slide means in a generally horizontally direction relatively toward said rotary milling cutter of said microtome in a plane parallel to the plane of said rotary milling cutter of said microtome;

removing a predetermined thickness of material of said specimen and casting resin medium by cutting by said rotary milling cutter thereby achieving a mirror-smooth, roughness-free, flatly-reduced, planar specimen surface.

4,066,729

EXTRUSION METHOD AND APPARATUS

Jan Baptist Van Cappellen, Berchem, Belgium, assignor to AGFA-Gevaert, N.V., Mortsel, Belgium

Continuation of Ser. No. 319,015, Dec. 27, 1972, abandoned, which is a continuation-in-part of Ser. No. 43,484, June 4, 1970, abandoned. This application Sept. 16, 1974, Ser. No. 506,574

Claims priority, application United Kingdom, June 4, 1969, 28315/69; Sept. 5, 1969, 44042/69

Int. Cl.[2] B29D *7/24*

U.S. Cl. 264—169 **8 Claims**

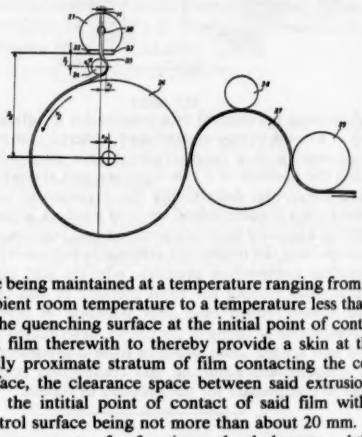
1. Method of producing polyethylene terephthalate film which comprises:

a. extruding molten polyethylene terephthalate along an extrusion plane in a generally downward direction through a downwardly opening slot orifice to form a molten film,

b. stretching the film longitudinally by drawing the film away from the extrusion orifice at a rate faster than the extrusion rate,

c. progressively delivering said stretched film into contact along one of the film surfaces with the peripheral surface of at least one quenching drum maintained at a conventional quenching temperature below the film softening range to solidify film and rotatably driven continuously in one direction to advance the drum surface substantially at said drawing away rate, said drum being located generally below said slot orifice with the peripheral surface region thereof which initially receives said film extending in one direction generally obliquely through and beyond the extrusion plane, and

d. in the gap between the extrusion slot and the adjacent peripheral section of said quenching drum surface, passing said film over its full width while still in substantially molten condition and before said one face is contacted with said quenching surface progressively into contact along its opposite face with an arcuate portion of a highly heat conductive smooth polished control surface moving at substantially said drawing away rate in an endless path including said arcuate portion, said arcuate surface portion arcuate surface portion having an angular extent of up to about 180° and sufficient to provide slip-resisting frictional contact between said film and said control surface and a radius of less than one-fourth the radius of the quenching drum and projecting through and beyond said extrusion plane in the opposite direction to said drum to introduce a bow-shaped deflection in the path of said film between said orifice and drum surface, said control surface being maintained at a temperature ranging from about ambient room temperature to a temperature less than that of the quenching surface at the initial point of contact of said film therewith to thereby provide a skin at the directly proximate stratum of film contacting the control surface, the clearance space between said extrusion slot and the intitial point of contact of said film with said control surface being not more than about 20 mm.



6. In an apparatus for forming polyethylene terephthalate films by extrusion along an extrusion plane in a generally downward direction of a molten polyethylene terephthalate through a downwardly opening slot orifice onto the surface of a rotatable quenching drum maintained at a conventional quenching temperature below the solidification temperature of the polymer, said drum being located beneath said orifice with the peripheral surface region thereof initially contacted by said film extending obliquely in one direction through and beyond the extrusion plane, the improvement comprising a continuous smooth polished control surface of a width at least equal to the width of said film and maintained at a temperature of at least about room temperature but less than the temperature of the quenching drum surface at the initial point of contact of said film with said developing drum surface to thereby provide a skin at the directly proximate stratum of film contacting said control surface, said control surface being movable through a continuous path including an arcuate portion with a radius less than one-fourth that of the quenching drum, at least said arcuate path portion being disposed in the gap between said orifice and said quenching surface for contact with the entire surface of the surface of said film opposite said quenching drum and

projecting through and beyond said extrusion plane in the opposite direction to said drum to produce a bow-shaped deflection in the film path in said gap of an arcuate extent up to about 180° and sufficient to provide slip-resisting friction contact between the film and said control surface, and means for rotating the quenching drum surface and for advancing said control surface in the same direction as the film in contact therewith and at substantially the same linear speed which is higher than the linear rate of extrusion of said film in order to stretch said film, the clearance space between said extrusion slot and the initial point of contact of said film with said control surface being not more than about 20 mm.

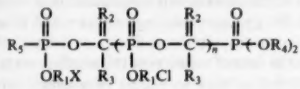
4,066,730
METHOD FOR PRODUCING REGENERATED CELLULOSE FIBERS HAVING EXCELLENT FLAMEPROOFNESS

Koji Mimura, Otake; Atsushi Kawai, Hiroshima; Yoshiya Kametani, and Tetsuro Nakahama, both of Yokohama, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1976, Ser. No. 661,859
Int. Cl.² D01F *2/08*
U.S. Cl. 264—191 **11 Claims**

1. A method for producing regenerated cellulose fibers having excellent flameproofness, which comprises:

adding a polyphosphonate represented by formula (1)



(1)

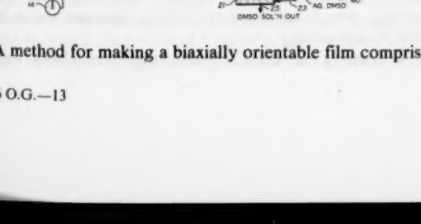
wherein R_1 is ethylene or propylene; R_2 and R_3 are methyl or ethyl which may be the same or different; R_4 is an alkyl group having 1 to 4 carbon atoms, or an aralkyl group in which the alkyl substituent has 1 to 4 carbon atoms and the hydrogen atoms in said alkyl and aralkyl groups may be substituted with chlorine or bromine; R_5 is an unsaturated or saturated aliphatic, alicyclic or aromatic group having 1 to 20 carbon atoms or combinations of said groups defining R_5 and R_5 may be a carbonyl group, or sulfonyl group containing substituent; X is halogen, and n is an integer from 1 to 1000, to a viscose in an amount of 5 to 40% by weight of the cellulose contained in the viscose; and then

spinning the viscose in a coagulation bath.

4,066,731
METHOD OF MAKING POLYMERIC ACRYLONITRILE FILMS

Gordon P. Hungerford, Palmyra, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 14, 1976, Ser. No. 676,843
Int. Cl.² B29D *7/02*
U.S. Cl. 264—216 **20 Claims**

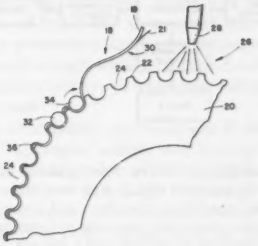


1. A method for making a biaxially orientable film comprising applying onto a film supporting cooled surface a concentrated solution of an acrylonitrile polymer in a solvent therefor that is water soluble to provide a film comprising said polymer and said solvent, contacting the resulting film with an aqueous medium to substantially remove and replace with water the solvent in the film, and recovering as the resultant film a biaxially orientable film consisting essentially of the acrylonitrile polymer and from about 20 to 75% by weight water.

4,066,732
TOOTHED BELT MAKING

John D. Redmond, Jr., Denver, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Nov. 19, 1976, Ser. No. 743,433
Int. Cl.² B29D *29/00*
U.S. Cl. 264—229 **11 Claims**



10. A method for manufacturing toothed elastomeric power transmission belting having a body and teeth attached thereto, and having a face cover formed on the outer surface of the teeth and substantially free of the elastomer, comprising: bonding the face cover temporarily to a notched mold surface with a temperature sensitive tackifier; elevating the temperature of the tackifier, sufficiently to cause the bond between the face cover and notched mold surface to be at least partially broken; introducing elastomeric material into the notches of the mold and curing the belting into a unitary member.

4,066,733
METAL EXTRACTION FROM SEA NODULES

Michael Dubeck, Birmingham, and Gordon G. Knapp, Southfield, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 562,904, March 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 396,763, Sept. 13, 1973, abandoned. This application Sept. 30, 1976, Ser. No. 728,275
Int. Cl.² C01G *3/14, 51/12, 53/12*
U.S. Cl. 423—32 **11 Claims**

1. In a process for recovering cobalt, nickel, copper and molybdenum from sea nodules containing copper, nickel, cobalt, molybdenum, manganese and iron and being substantially free of sulfidic sulfur which comprises

1. treating comminuted ore with gaseous reactant selected from the group consisting of alcohols, aldehydes and mixtures thereof;
2. leaching said treated ore with aqueous solution containing ammonia and ammonium salt other than a sulfite or bisulfite;
3. separating any insoluble material which remains after said leaching

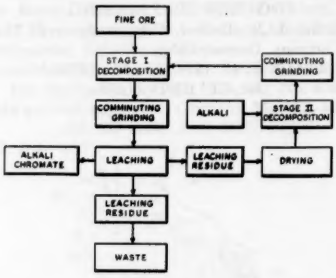
whereby a solution containing soluble copper, nickel, cobalt, and molybdenum substantially free of manganese and iron is obtained, the improvement which comprises treating said comminuted ore with said gaseous reactant at elevated temperatures lower than about 400° C., and providing sulfite in said leaching solution whereby cobalt solubilization is increased.

4,066,734

ALKALINE DISINTEGRATION OF CHROMITES

Wolfgang Bockelmann, Leverkusen; Hans-Georg Nieder-Vahrenholz, Cologne; Hans Niederprüm, Duesseldorf, and Heinz Jonas, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 7, 1976, Ser. No. 721,129
Claims priority, application Germany, Sept. 20, 1975, 2542054
Int. Cl.[2] C01G *37/00*
U.S. Cl. 423—61 3 Claims



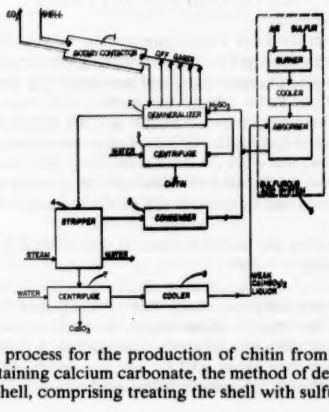
1. In the alkaline-oxidative disintegration of chromites into chromates with an alkali which is at least one member selected from the group consisting of sodium and potassium hydroxides and carbonates, comprising reacting a chromium ore with said alkali in the presence of oxygen and a diluent, and leaching the reaction mixture with at least one of water and/or a chromate-containing aqueous solution, the improvement which comprises heating the residue obtained after leaching with an excess of alkali, based on the chromium oxide content of the residue, in the presence of oxygen, the alkali being at least one member selected from the group consisting of sodium and potassium hydroxides and carbonates, grinding the reaction mixture and, without leaching, employing the ground reaction mixture as an alkali source in another chromite disintegration cycle.

4,066,735

PROCESS FOR DEMINERALIZATION OF CRUSTACEA SHELLS

Quintin P. Peniston, Rte. 7, Box 7710, Bainbridge Island, Wash. 98110, and Edwin Lee Johnson, Rte. 5, Box 4246, Issaquah, Wash. 98027

Continuation of Ser. No. 443,741, Feb. 19, 1974, abandoned. This application Nov. 15, 1976, Ser. No. 742,130
Int. Cl.[2] C01F *11/46*
U.S. Cl. 423—159 6 Claims



1. In a process for the production of chitin from crustacea shell containing calcium carbonate, the method of demineralizing said shell, comprising treating the shell with sulfurous acid in amount in excess of that required, on a molar basis, to convert the calcium carbonate of the shell to a solution of calcium bisulfite and sufficient to prevent calcium sulfite precipitation, separating the chitin in said shell from said solution, regenerating sulfurous acid from the calcium bisulfite solution and reusing the regenerated sulfurous acid to demineralize additional shell in the process.

4,066,736

PROCESS FOR PRODUCING CONCENTRATED SOLUTIONS OF HYDROXYLAMMONIUM NITRATE AND HYDROXYLAMMONIUM PERCHLORATE

Thomas Liggett, Indian Head, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 19, 1976, Ser. No. 668,569
Int. Cl.[2] C01B *21/14*
U.S. Cl. 423—386 12 Claims

1. In a process for producing concentrated hydroxylammonium nitrate solutions by reacting an alkaline earth nitrate salt selected from the group consisting of barium nitrate and calcium nitrate with a hydroxylammonium salt selected from the group consisting of hydroxylammonium sulfate and hydroxylammonium acid sulfate, the improvement comprising:

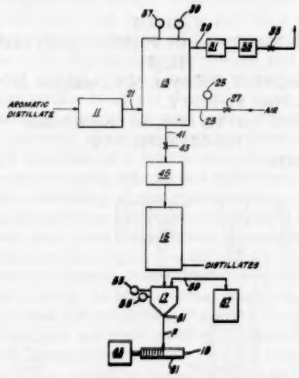
adding the hydroxylammonium salt to a slurry of particles of the alkaline earth nitrate salt suspended in a solvent selected from the group consisting of water and an aqueous hydroxylammonium nitrate solution at a rate which is slower than the rate of solution of the alkaline earth nitrate into the solvent so that an excess of alkaline earth ions over sulfate ions is maintained in the solvent to prevent the formation of a coating of the insoluble alkaline earth sulfate byproduct on the surfaces of the alkaline earth nitrate particles which would prematurely stop the reaction.

4,066,737

METHOD FOR MAKING ISOTROPIC CARBON FIBERS

George R. Romovacek, Monroeville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 140,474, May 5, 1971, abandoned. This application Mar. 2, 1973, Ser. No. 337,457
Int. Cl.[2] B01J *3/06*
U.S. Cl. 423—447.6 5 Claims



1. A method for preparing isotropic carbon fibers from hydrocarbon distillates selected from coal tar distillates boiling between about 200° to 400° C, straight run petroleum distillates boiling between about 200° to 600° C and catalytically cracked recycle petroleum distillates boiling between about 200° to 500° C comprising:

a. reacting the distillate with a gas containing elemental

oxygen at a temperature of from about 250° to about 420° C until at least 0.5 standard cubic foot of elemental oxygen is reacted per pound of distillate and the distillate is converted to a pitch like substance which yields isotropic carbon upon subsequent carbonization;

b. forming a fiber from the oxidized hydrocarbon distillate;

c. carbonizing the fiber in an inert atmosphere at temperatures

in excess of 800° C.

4,066,738

PROCESS FOR PRODUCING A FUEL GAS AND SULFUR FROM A HYDROCARBON FUEL

Ernest L. Daman, Westfield, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Nov. 19, 1976, Ser. No. 743,444
Int. Cl.² C01B *17/06*
U.S. Cl. 423—569 **3 Claims**

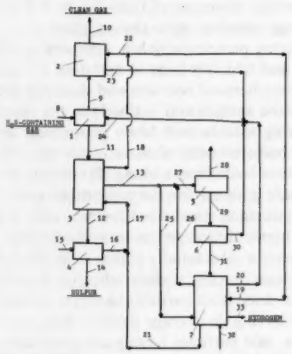
1. A process for producing a fuel gas and sulfur from a hydrocarbon fuel comprising the steps of establishing a first fluidized bed of sorbent material for the sulfur in said fuel, at least partially combusting said fuel in said bed under reducing conditions to produce a fuel gas and a sulfided sorbent, passing said fuel gas to the burners associated with a boiler, passing the combustion gases from said boiler to said fluidized bed, establishing a second fluidized bed, regenerating said sulfided sorbent in said second fluidized bed to produce regenerated sorbent and a sulfur containing gas, passing said sulfur containing gas into a reactor vessel, conveying a continuous supply of granular coal through said reactor vessel in contact with said sulfur containing gas under conditions to burn said coal and produce elemental sulfur, and passing the burned coal from said reactor vessel to said first fluidized bed to combust any unburned carbon present therein.

4,066,739

PROCESS FOR RECOVERING HYDROGEN AND ELEMENTAL SULFUR FROM HYDROGEN SULFIDE AND/OR MERCAPTANS-CONTAINING GASES

Wu-Chi Chen, 859 Brittmoore Road, Houston, Tex. 77079

Filed Mar. 30, 1976, Ser. No. 672,004
Int. Cl.² C01B *17/02, 1/03, 7/18, 7/14*
U.S. Cl. 423—571 **2 Claims**



1. A process for recovering hydrogen and elemental sulfur from hydrogen sulfide-containing gas consisting essentially of

a. removing hydrogen sulfide from hydrogen sulfide-containing gas by passing said hydrogen sulfide-containing gas through aqueous iodine slurry and operating at temperature between about −20° C. and +80° C. and pressure between about 10 psia. and 5000 psia. to obtain a mixture of elemental sulfur and concentrated hydriodic acid in which concentrated hydriodic acid contains more than 40% by weight of hydrogen iodide and less than 60% by weight of water, and to obtain hydrogen sulfide-lean gas which is subsequently washed with dilute hydriodic acid and fresh water to obtain a gaseous stream which is substantially free of sulfide and any entrained iodide;

b. recovering substantially pure elemental sulfur from said mixture of elemental sulfur and concentrated hydriodic acid by solid-liquid separation to obtain concentrated hydriodic acid filtrate and sulfur cake which is subsequently washed with wash water and is then melted to recover substantially pure elemental sulfur;

c. flashing said concentrated hydriodic acid filtrate to remove any dissolved hydrogen sulfide for recycling and to obtain sulfide-free solution which is then dehydrated to obtain anhydrous hydrogen iodide;

d. manufacturing hydrogen from said anhydrous hydrogen iodide by pressurizing anhydrous hydrogen iodide to between about 200 psia. and 5000 psia., heating this pressurized anhydrous hydrogen iodide to a decomposition temperature of about 150° C. to about 600° C., and then passing this pressurized and heated anhydrous hydrogen iodide through a high surface catalyst-containing bed to obtain a gaseous mixture of hydrogen, iodine, and hydrogen iodide; and

e. recovering substantially pure hydrogen from said gaseous mixture of hydrogen, iodine, and hydrogen iodide by cooling the gaseous mixture of hydrogen, iodine, and hydrogen iodide to above the dew point of hydrogen contained in the gaseous stream to condense and separate substantially pure liquid iodine from the gaseous stream for recycling and then cooling the resulting gaseous stream to below 150° C. to condense and separate liquid hydrogen iodide and trace amount of iodine for recycling and to obtain hydrogen-rich gas which is subsequently washed with concentrated and dilute hydriodic acid, and fresh water to obtain substantially pure hydrogen.

4,066,740

METHOD FOR PRODUCING ALUMINA

Henry Erickson, Park Forest, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Dec. 6, 1971, Ser. No. 205,355
Int. Cl.² C01F *7/02;* **B01J** *21/04*
U.S. Cl. 423—628 **14 Claims**

1. A method for producing calcined alumina having increased porosity which comprises:

1. forming a mixture of an aqueous slurry of hydrous alumina and at least one surface active agent, said hydrous alumina predominating in α-alumina monohydrate having a crystallite size of less than 100A, the molecules of said surface active agent comprising at least one hydrophobic portion and at least one hydrophilic portion, said hydrous alumina being present in the mixture in an amount from about 8% to about 14% by weight (calculated as Al_2O_3) of the total mixture and said surface active agent being present in the mixture in an amount of from about 0.001% to about 1% by weight based on the total amount of water present in said mixture, including the water of hydration, sufficient to increase the porosity of the calcined alumina hereinafter described;

2. drying said mixture to obtain a solid product which can be formed into macrosized particles;

3. forming said solid product into macrosized particles, said particles upon calcination having a minimum dimension of at least about 0.01 inch; and

4. calcining said macrosized particles to form calcined alumina having increased porosity.

4,066,741

PROCESS FOR THE PRODUCTION OF HYDROGEN BY THE THERMAL DECOMPOSITION OF WATER

Shoichi Sato, Mito, Japan, assignor to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Nov. 5, 1975, Ser. No. 628,930
Claims priority, application Japan, Nov. 8, 1974, 49-128652
Int. Cl.[2] C01B *1/02, 2/06, 1/08, 13/00*
U.S. Cl. 423—658 2 Claims

1. A process for the production of hydrogen by the decomposition of water at a temperature not greater than 1000° C, comprising an interrelated combination of the following five reactions:

1. reacting iron (II) chloride and carbon dioxide at a temperature of 500° C or greater thereby producing (a) iron oxides mainly comprising iron (III) oxide, (b) iron (III) chloride, and (c) carbon monoxide,
2. reacting said carbon monoxide (c) with water vapor thereby producing carbon dioxide and hydrogen;
3. reacting said iron (III) oxide produced in reaction (1) with hydrogen chloride produced in reaction (5) below, thereby producing iron (III) chloride and water;
4. thermally decomposing said iron (III) chloride, thereby producing iron (II) chloride which is recycled into reaction (1) above, and chlorine; and
5. reacting said chlorine produced in reaction (4) with water vapor thereby producing hydrogen chloride which is recycled into reaction (3) above, and oxygen;

the hydrogen produced in reaction (2) above, being the primary product of said process.

4,066,742

TC-99M SULFUR COLLOID RADIOPHARMACEUTICALS

Michael David Garrett, Alameda, Calif., assignor to Medi-Physics, Inc., Emeryville, Calif.

Filed Feb. 14, 1977, Ser. No. 768,128
Int. Cl.[2] A61K *29/00, 43/00;* G01T *1/161*
U.S. Cl. 424—1 7 Claims

1. A method for the preparation of a stannous sulfur colloid reagent suitable for the preparation of a size-stabilized Tc-99m-labeled radiopharmaceutical which comprises:

a. adding a sufficient quantity of a 1 molar colloid of stannous chloride in sterile, pyrogen-free water to a predetermined quantity of distilled water to achieve a stannous chloride concentration in the final reagent of between about 0.5 and about 2.0 millimoles;
b. adding to the mixture of step a) a sufficient quantity of 5% by weight aqueous solution of gelatin to achieve a gelatin concentration in the final reagent of between about 0.05% by weight and about 1.0% by weight;
c. treating the mixture of step b) with hydrogen sulfide gas;
d. purging the reagent formed in c) with nitrogen gas;
e. filtering said reagent through a filter having openings of 0.45 micron; and
f. aseptically sealing said reagent in a nitrogen-purged ampul.

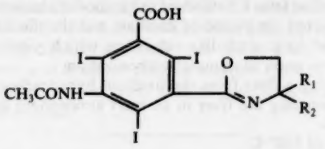
4,066,743

X-RAY CONTRAST AGENTS

Mills T. Kneller, University City, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed June 21, 1976, Ser. No. 697,999
Int. Cl.[2] C07D *263/14;* A61K *29/02*
U.S. Cl. 424—5 12 Claims

1. A compound of the formula:



wherein R_1 is hydroxymethyl and R_2 is selected from the group consisting of hydroxymethyl and a lower alkyl group containing between 1 and 4 carbon atoms, and esters thereof with lower alkanols, salts thereof with pharmaceutically acceptable cations, and acyl halides thereof.

10. An X-ray contrast medium comprising an aqueous solution of a salt of a compound selected from the group consisting of 3-acetamido-5-(4,4-bishydroxymethyl-2-oxazolinyl)-2,4,6-triiodobenzoic acid and 3-acetamido-5-(4-methyl-4-hydroxymethyl-2-oxazolinyl)-2,4,6-triiodobenzoic acid with at least one pharmaceutically acceptable cation.

4,066,744

SEROLOGICAL REAGENT, TEST SLIDE AND METHOD FOR GONORRHEAL ANTIBODIES

Richard T. Price, Verona, and Rita C. Prodell, West Orange, both of N.J., assignors to Akzona Incorporated, Asheville, N.C.

Continuation-in-part of Ser. No. 347,975, April 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 214,213, Dec. 30, 1971, Pat. No. 3,770,383, which is a continuation-in-part of Ser. No. 131,172, April 5, 1971, Pat. No. 3,666,421, which is a continuation-in-part of Ser. No. 818,366, April 22, 1969, abandoned. This application Jan. 16, 1976, Ser. No. 649,768
Int. Cl.[2] C12K *1/04;* G01N *31/00, 31/02, 31/06*
U.S. Cl. 424—12 20 Claims

1. A reagent for the detection of gonorrheal antibodies in human blood serum or synovial fluid by the immunochemical reaction of the antibodies with gonorrheal antigens, consisting essentially of a supply of spheroidally-shaped latex particles having an average diameter of from 0.2 to 1.3 microns, said particles having adsorbed upon their surface

a. presensitizing protein, which is a dispersing agent for the particles and which is inert to and does not participate in the immunochemical reaction and does not detrimentally influence the antigen and antibody in the reaction, and
b. a sensitizing soluble heat labile gonorrheal antigen from ruptured bacterial cells of an antigenic strain of Neisseria gonorrhoeae bacteria exhibiting T_1 colonial morphology.

6. A test slide adapted for the performance on the surface thereof of an immunochemical test for detection of gonorrheal antibodies in human blood serum or synovial fluid, having as essential elements a substantially planar strip of substrate material having at least one test surface whereon is positioned (1) a deposit of solid dried latex particles having a generally spheroidal shape and having an average particle diameter of from 0.2 to 1.3 microns, said particles having adsorbed upon their surface, (a) a presensitizing protein which is a dispersing agent for the particles and which is inert thereto and does not participate in the immunochemical reaction and does not detrimentally influence the antigen and antibody involved in the reaction, and (b) a sensitizing soluble heat labile gonorrheal antigen from ruptured bacterial cells of an antigenic strain of Neisseria gonorrhoeae bacteria exhibiting T_1 colonial morphology, (2) a second dried deposit of absorbing antigen capable of combining with heterophile antibodies in said serum or synovial fluid, said test deposits being positioned in close proximity on said test surfaces.

4,066,745

DENTIFRICE

Kenneth Tomlinson, Bramhall, and Michael Harrison, New Castle upon Tyne, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 446,453, Feb. 27, 1974, Pat. No. 3,946,108, which is a continuation of Ser. No. 202,664, Nov. 26, 1971, abandoned. This application Feb. 25, 1976, Ser. No. 661,238

Int. Cl.[2] A61K *7/16*

U.S. Cl. 424—49 7 Claims

1. An extrudible visually clear gel flavored dentifrice with strengthened flavor, taste and smell sensations, containing evenly distributed therein visible bubbles of gas containing volatilized flavor material and of diameter in the 1 to 4 millimeter range and distributed uniformly throughout the dentifrice so that there are from 2 to 40 bubbles per cubic centimeter of dentifrice, which dentifrice is of attractive appearance and comprises a transparent polishing agent which is of a refractive index matching that of the rest of the dentifrice, is insoluble in the rest of the dentifrice and is in particulate form, with the particles thereof being less than 100 microns in diameter, a gelling agent which is an organic or inorganic gum or thickener which produces a clear gel in the described composition, a vehicle which includes a polyhydric alcohol having a refractive index matching that of the other constituents, and a detergent or foaming agent, and is of a viscosity sufficient to maintain positions of the bubbles suspended therein during a shelf life of 6 months.

4,066,746

REDUCING THE DRYING TIME OF HAIR WITH FLUORINE-CONTAINING VINYL POLYMERS

Martin Callingham, Richmond, and Kenneth Vasey Curry, Camberley, both of England, assignors to Lever Brothers Company, New York, N.Y.

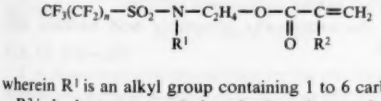
Continuation of Ser. No. 458,150, April 5, 1974, abandoned, which is a continuation of Ser. No. 265,940, June 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 819,449, April 25, 1969, abandoned. This application Oct. 16, 1975, Ser. No. 623,166

Claims priority, application United Kingdom, May 1, 1968, 20651/68; June 13, 1968, 28145/68

Int. Cl.[2] A61K *7/06, 7/135*

U.S. Cl. 424—62 5 Claims

1. A method of treating hair on the head to reduce the time required for the drying thereof when wet, which comprises applying thereto in a cosmetically acceptable carrier suitable for application to human hair an effective amount of a vinyl polymer selected from the group consisting of homopolymers, copolymers, block copolymers and graft copolymers of a fluorine-containing monomer of the formula:



wherein R^1 is an alkyl group containing 1 to 6 carbon atoms R^2 is hydrogen or methyl, and n is an integer from 3 to 11, the vinyl polymer having a molecular weight of from 20,000 to 1,000,000, and when the polymer is a copolymer, the ratio of the fluorine-containing monomer to the comonomer or comonomers being from 10:1 to 1:1 and said comonomer being selected from the group consisting of halogenated and non-halogenated maleic anhydride, acrylonitrile, vinyl acetate, vinyl chloride, vinyl silicones, styrene, methyl acrylate, methyl methacrylate, ethylene, isoprene and butadiene.

4,066,747

POLYMERIC ORTHOESTERS HOUSING BENEFICIAL DRUG FOR CONTROLLED RELEASE THEREFROM

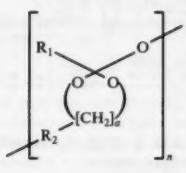
Richard C. Capozza, Palo Alto, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Apr. 8, 1976, Ser. No. 675,185

Int. Cl.[2] A61K *31/74*

U.S. Cl. 424—78 10 Claims

1. A composition of matter comprising an orthoester polymer of the formula:



wherein R_1 is a member selected from the group consisting of hydrogen, alkyl of 1 to 20 carbon atoms, alkenyl of 2 to 20 atoms, cycloalkyl of 3 to 8 carbon atoms, cycloalkyl of 3 to 8 carbons substituted with a member selected from the group consisting of alkyl of 1 to 20 carbon atoms, alkenyl of 2 to 20 carbon atoms and alkoxy of 1 to 20 carbon atoms, cycloalkenyl of 4 to 8 carbon atoms, and cycloalkenyl of 4 to 8 carbon atoms substituted with a member selected from the group consisting of alkyl of 1 to 20 carbon atoms, alkenyl of 2 to 20 carbon atoms and alkoxy of 1 to 20 carbon atoms; and R_2 is a member selected from the group consisting of alkylene of 1 to 20 carbon atoms, alkenylene of 2 to 20 carbon atoms, cycloalkylene of 3 to 8 carbon atoms, cycloalkylene of 3 to 8 carbon atoms substituted with a member selected from the group consisting of alkyl of 1 to 20 carbon atoms, alkenyl of 2 to 20 carbon atoms and alkoxy of 1 to 20 carbon atoms; cycloalkylene of 4 to 8 carbon atoms, and cycloalkenylene of 4 to 8 carbon atoms substituted with a member selected from the group consisting of alkyl of 1 to 20 carbon atoms, alkenyl of 2 to 20 carbon atoms and alkoxy of 1 to 20 carbon atoms; a is 2 to 3, n is greater than 10, and about 0.01% to about 40% by weight of a beneficial drug dispersed in said polymer, and wherein said drug is released at a controlled and continuous rate to the environment of use as said polymer erodes over a prolonged period of time.

4,066,748

CONTINUOUS PROCESS FOR PRODUCING AN AQUEOUS SOLUTION OF FERRIC CHLORIDE

Jean-Marie Lietard, Gent, and Guido Matthijs, Mariakerke, both of Belgium, assignors to U C B, Societe Anonyme, Brussels, Belgium

Filed Aug. 13, 1976, Ser. No. 714,323

Claims priority, application United Kingdom, Aug. 13, 1975, 33701/75

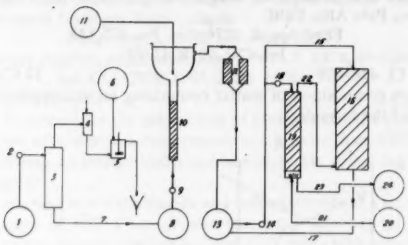
Int. Cl.[2] C01G *49/10*

U.S. Cl. 424—147 5 Claims

1. A process for producing an aqueous solution of ferric chloride from a pickling liquor containing ferrous chloride comprising the steps of

1. continuously concentrating the pickling liquor by evaporation to at least about 34.25% by weight ferrous chloride concentration;
2. continously neutralizing the resulting concentrated liquor, which still contains free hydrochloric acid, by means of a fluidized bed of iron oxide particles; and
3. continuously countercurrently chlorinating the resulting neutralized concentrated liquor in two succesive reaction zones, to the extent of from 73 to 86% at a temperature of from 35° to 75° C in the first reaction zone and the balance at a temperature of from 40° to 100° C in the second reaction zone, whereby an aqueous solution containing

per liter at least 40% by weight of ferric chloride, less than 0.1% by weight of ferrous chloride and less than 0.1% by



weight of free hydrochloric acid, is obtained, said solution being directly usable for purifying water.

4,066,749

TETRAPEPTIDE ANALOG OF TRH

Daniel F. Veber, Ambler; Ruth F. Nutt, Green Lane, and Ralph F. Hirschmann, Blue Bell, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 24, 1977, Ser. No. 761,760
Int. Cl.[2] A61K *37/00;* **C07C** *103/52*
U.S. Cl. 424—177 **5 Claims**

1. A process for the preparation of the compound of formula:

L-Kpc-L-His-L-Tca-β-Ala-NH_2

or a pharmaceutically acceptable salt thereof, which comprises the formation of a peptide bond between:

1. L-Kpc-OH and L-His-L-Tca-β-Ala-NH_2;
2. L-Kpc-L-His-OH and L-Tca-β-Ala-NH_2;
3. L-Kpc-L-His-L-Tca-OH and β-ala-NH_2; or
4. L-Kcp-His-L-Tca-β-Ala-OH and NH_3.

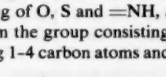
4,066,750

LACTOSYL SUBSTITUTED UREIDES IN RUMINANT FEEDSTUFF

Roy Henry Smith, and Alexander Baxter McAllan, both of Reading, England, assignors to Astra Chemical Products AB, Sodertalje, Sweden

Filed Aug. 2, 1976, Ser. No. 710,637
Int. Cl.[2] A61K *31/70;* **C07H** *5/06*
U.S. Cl. 424—180 **6 Claims**

1. A ruminant feedstuff composition for increasing beef and milk production containing as a non-protein nitrogen source an effective amount of a compound of the general formula



wherein R_1 is lactosyl, X is a functional group selected from the group consisting of O, S and =NH, and R_2 is a functional group selected from the group consisting of hydrogen, glucosyl and alkyl having 1–4 carbon atoms and a suitable nutritional base.

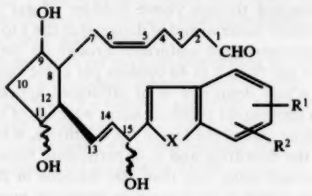
4,066,751

PROSTAGLANDIN ANALOGUES

Masaki Hayashi; Seiji Kori, and Tadao Tanouchi, all of Takatsuki, Japan, assignors to Ono Pharmaceutical Company, Osaka, Japan

Filed Oct. 23, 1975, Ser. No. 625,342
Claims priority, application United Kingdom, Oct. 28, 1974, 46597/74
Int. Cl.[2] A61K *31/715;* **C08B** *37/16*
U.S. Cl. 424—180 **10 Claims**

1. Prostaglandin analogues of the general formula:



(wherein X represents an oxygen or sulphur atom, R^1 and R^2, which may be the same or different, each represent a hydrogen atom or an alkyl group containing from 1 to 3 carbon atoms, an alkenyl group containing from 2 to 4 carbon atoms or a trifluoromethyl group, and the double bonds depicted in positions C_5–C_6 and C_{13}–C_{14} and cis and trans respectively), and cyclodextrin clathrates thereof.

6. A method for the production of a luteolytic effect in a female mammal which comprises the administration to the female mammal of a prostaglandin analogue as claimed in claim 1 or a cyclodextrin clathrate thereof.

4,066,752

1-DESAMINO-1-HYDROXY AND 1-DESAMINO-1-EPI-HYDROXY-4,6-DI-O-(AMINOGLYCOSYL)-1,3-DIAMINOCYCLITOLS; 1-DESAMINO-1-OXO-4,6-DI-O-(AMINOGLYCOSYL)-1,3-DIAMINOCYCLITOLS, INTERMEDIATES AND USE AS ANTIBACTERIAL AGENTS

Alan K. Mallams, West Orange, N.J., and David Huw Davies, Macclesfield, England, assignors to Schering Corporation, Kenilworth, N.J.

Filed June 21, 1976, Ser. No. 697,804
Int. Cl.[2] A61K *31/71;* **C07H** *15/22*
U.S. Cl. 424—180 **20 Claims**

19. The method of eliciting an antibacterial response in a warm-blooded animal having a susceptible bacterial infection which comprises administering to said animal a non-toxic antibacterially effective amount of a member selected from the group consisting of a 1-desamino-1-hydroxy and a 1-desamino-1-epihydroxy analog of a 4,6-di-O-(aminoglycosyl)-1,3-diaminocyclitol having antibacterial activity;

and the pharmaceutically acceptable acid addition salts thereof.

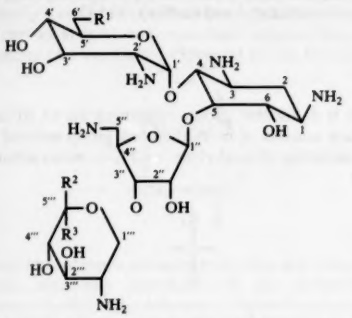
4,066,753

NEOMYCIN AND PAROMOMYCIN DERIVATIVES

Stephen Hanessian, Beaconsfield, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed May 27, 1976, Ser. No. 690,733
Int. Cl.[2] A61K *31/71;* **C07H** *15/22*
U.S. Cl. 424—181 **11 Claims**

1. A compound having the formula



(1)

wherein R^1 is selected from $—NH_2$ and —OH, one of R^2 and R^3 is $—CH_2NH_2$ and the other is hydrogen; or a non-toxic pharmaceutically acceptable acid addition salt thereof.

11. A method of treating amoebic dysentery in human beings and in animals, which method comprises administering an effective amount of a compound according to claim 1 to the human being or animal.

4,066,754
SLOW RELEASE BOLUS

Shih-Toon Chou, St. Louis, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Filed Apr. 26, 1976, Ser. No. 680,025
Int. Cl.[2] A61K *31/635, 31/65, 47/00*
U.S. Cl. 424—229 **29 Claims**

1. An improved method of preparing a sustained release veterinary bolus for ruminant animals having a therapeutically active substance, filler material, binder and lubricant wherein the improvement comprises forming the binder by combining an effective amount of zein and an organic solvent, mixing the binder with the therapeutically active substance and filler material to granulate the mixture, drying the mixture, adding a lubricant, blending the dried mixture with an effective amount of zein to insure sustained release of the therapeutically active substance and forming a bolus of sufficient density that will remain in a ruminant animal to release the therapeutically active substance for a period of time up to 15 days in a predictable, controllable pattern.

4,066,755
PHENYLAMINOETHANOL DERIVATIVES FOR TREATING HYPERTENSION

Lawrence Henry Charles Lunts, and David Trevor Collin, both of London, England, assignors to Allen & Hanburys Limited, London, England

Division of Ser. No. 420,547, Nov. 30, 1973, Pat. No. 4,012,444, which is a continuation of Ser. No. 59,979, June 29, 1970, abandoned. This application Dec. 22, 1976, Ser. No. 753,558
Claims priority, application United Kingdom, July 8, 1969, 34379/69
Int. Cl.[2] A61K *31/60*
U.S. Cl. 424—230 **10 Claims**

1. A pharmaceutical composition for the treatment of hypertension, comprising as active ingredient, an effective amount of 5-[1-hydroxy-2-(1-methyl-3-phenylpropyl)aminoethyl]-salicylamide or a physiologically acceptable acid addition salt thereof in association with a non-toxic pharmaceutically acceptable carrier.

7. A method of treating a human patient suffering from hypertension by blocking both α- and β-adrenergic receptors in the patient, characterized in that there is administered orally, by suppository or by injection, an effective amount of a compound having both α- and β-blocking activity, which compound is 5-[1-hydroxy-2-(1-methyl-3-phenylpropyl)aminoethyl] salicylamide or a physiologically acceptable acid addition salt thereof.

4,066,756
THERAPEUTIC COMPOSITIONS OF 1,3-BIS(2-CARBOXYCHROMON-5-YLOXYL)PROPAN-2-OL AND ASPIRIN OR INDOMETHACIN

Thomas Samuel Campbell Orr, Melton Mowbray; David Edward Hall, Burton-on-the-Wolds, and John Mann, Long Whatton, all of England, assignors to Fisons Limited, London, England

Filed Nov. 18, 1976, Ser. No. 742,750
Claims priority, application United Kingdom, Nov. 28, 1975, 48935/75
Int. Cl.[2] A61K *31/35, 31/40, 31/625*
U.S. Cl. 424—232 **14 Claims**

1. A pharmaceutical composition comprising 1,3-bis-(2-carboxy-chromon-5-yloxy)propan-2-ol, or a pharmaceutically acceptable salt thereof, as active ingredient, in combination with about 0.12 to 6000 parts by weight of aspirin or about 0.02 to 1000 parts by weight of indomethacin to each part by weight of active ingredient.

4,066,757
ORAL CONTRACEPTIVE REGIMEN

Samuel A. Pasquale, Basking Ridge, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Mar. 26, 1973, Ser. No. 344,668
Int. Cl.[2] A61K *31/56, 31/57, 31/58*
U.S. Cl. 424—243 **6 Claims**

1. In a method for the prevention of conception of the type wherein a progestin is administered to the human female serially over at least the fifth through the twenty-fifth day of the cycle, the improvement consisting of:

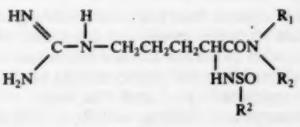
administering a substantially higher dose of a progestin during approximately the last 7 days of administration than during approximately the first 7 days of administration and terminating the administration of the progestational agent on or after the twenty-fifth day of the cycle.

4,066,758
N^2-NAPHTHALENESULFONYL-L-ARGININE DERIVATIVES, AND THE PHARMACEUTICALLY ACCEPTABLE ACID ADDITION SALTS THEREOF

Shosuke Okamoto, Kobe; Ryoji Kikumoto, Tokyo; Kazuo Ohkubo, Tokyo; Shinji Tonomura, Tokyo; Yoshikuni Tamao; Tohru Tezuka, both of Yokohama, and Akiko Hijikata, Kobe, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, both of, Japan

Continuation-in-part of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Mar. 29, 1976, Ser. No. 671,436
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-23268; Feb. 26, 1975, 50-23635; Mar. 5, 1975, 50-26768; Mar. 11, 1975, 50-29357; Mar. 11, 1975, 50-29358
The portion of the term of this patent subsequent to Sept. 20, 1994, has been disclaimed.
Int. Cl.[2] A61K *31/445;* **C07D** *211/16*
U.S. Cl. 424—244 **11 Claims**

1. N^2-naphthalenesulfonyl-L-arginine amides having the formula



or the acid addition salts thereof with a pharmaceutically acceptable acid, wherein R_1 and R_2 are members selected from the group consisting of hydrogen and a hydrocarbon selected

from the group consisting of C_{1-10} alkyl, C_{6-10} aryl, C_{7-15} aralkyl, C_{3-10} cycloalkyl and C_{4-15} cycloalkylalkyl, or R_1 or R_2 together form a polymethyleneiminyl group of 3-10 carbon atoms, the methylene groups of which are optionally substituted by one or two alkyl groups of not more than 10 carbon atoms; and R' is a member selected from the class consisting of 1-naphthyl substituted with one member selected from the class consisting of alkoxy and alkoxycarbonyloxy, respectively containing not more than 10 carbon atoms; and 2-naphthyl substituted with a member selected from the class consisting of alkoxy and alkoxycarbonyloxy, respectively containing not more than 10 carbon atoms.

11. A method for inhibiting activity and suppressing of activation of thrombin in vivo, comprising administering to a patient a pharmaceutically effective amount of a compound of claim **1**.

4,066,759

N^2-NAPHTHALENESULFONYL-L-ARGININE DERIVATIVES, AND THE PHARMACEUTICALLY ACCEPTABLE ACID ADDITION SALTS THEREOF

Shosuke Okamoto; Akiko Hijikata, both of Kobe; Ryoji Kikumoto, Machida; Yoshikuno Tamao, Yokohama; Kazuo Ohkubo, Machida; Tohru Tezuka, Yokohama, and Shinji Tonomura, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, both of, Japan

Continuation-in-part of Ser. No. 671,436, March 29, 1976, which is a continuation-in-part of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,586

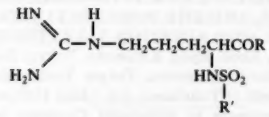
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635; Mar. 5, 1975, 50-026768; Mar. 11, 1975, 50-029357; Mar. 11, 1975, 50-029358

The portion of the term of this patent subsequent to Jan. 3, 1995, has been disclaimed.

Int. Cl.[2] **A61K** *31/445;* **C07D** *211/16*

U.S. Cl. 424—244 **8 Claims**

1. N^2-naphthalenesulfonyl-L-arginine esters and amides having the formula



I

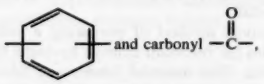
or the acid addition salts thereof with a pharmaceutically acceptable acid wherein R is selected from the class consisting of (1) alkoxy, alkenyloxy, alkynyloxy and cycloalkoxy, respectively containing not more than 10 carbon atoms, aralkyloxy of not more than 15 carbon atoms, tetrahydrofurfuryloxy, and alkoxy of not more than 10 carbon atoms substituted with an alkoxy group of not more than 10 carbon atoms, halogen or nitro; (2)

wherein R_1 is selected from the class consisting of alkenyl of not more than 10 carbon atoms, and substituted alkyl containing not more than 20 carbon atoms wherein said substituent is a member selected from the class consisting of alkoxy, alkoxycarbonyl, arylcarbamoyl, acyl, acyloxy, N,N-polymethylenecarbamoyl and carboxy; and R_2 is selected from the class consisting of hydrogen, alkyl and alkenyl, respectively containing not more than 10 carbon atoms; and substituted alkyl containing not more than 20 carbon atoms wherein said substituent is a member selected from the class consisting of alkoxy, alkoxycarbonyl, arylcarbamoyl, acyl, acyloxy, N,N-polymethylenecarbamoyl and carboxy; and (3)

wherein Z is a divalent group containing up to 20 carbon atoms, which consists of more than one group selected from the class consisting of methylene $—CH_2—$, mono-substituted methylene

wherein R_3 is selected from the class consisting of alkyl, acyl, alkoxy and alkoxycarbonyl, respectively containing not more than 10 carbon atoms, and carbamoyl; and disubstituted methylene

wherein R_4 and R_5 are alkyl groups of not more than 10 carbon atoms, and which may further contain at least one member selected from the class consisting of cycloalkylene of not more than 10 carbon atoms, phenylene



which may be arranged in any order and complete the

ring together with the said methylene, monosubstituted methylene or disubstituted methylene; with the proviso that Z is not polymethylene of 3–10 carbon atoms or polymethylene of 3–10 carbon atoms substituted by one or two alkyl groups of not more than 10 carbon atoms and R' is a member selected from the class consisting of 5,6,7,8-tetrahydro-1-naphthyl, 5,6,7,8-tetrahydro-2-naphthyl, 1-naphthyl, 2-naphthyl, 1-naphthyl substituted with one member selected from the class consisting of alkoxy and alkoxycarbonyloxy, respectively containing not more than 10 carbon atoms; and 2-naphthyl substituted with a member selected from the class consisting of alkoxy and alkoxycarbonyloxy, respectively containing not more than 10 carbon atoms.

8. A method for inhibiting activity and suppressing activation of thrombin in vivo, which comprises administering to a mammal a pharmaceutically effective amount of a compound of claim **1**.

4,066,760

AGRICULTURAL AND HORTICULTURAL FUNGICIDAL COMPOSITIONS

Seigo Kawada, Fujieda, and Shigeru Hayashi, Shizuoka, both of Japan, assignors to Kumiai Chemical Industries Ltd., Tokyo, Japan

Filed Mar. 24, 1977, Ser. No. 781,042

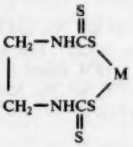
Claims priority, application Japan, Mar. 29, 1976, 51-35013; Mar. 29, 1976, 51-35014

Int. Cl.[2] **A01N** *9/02, 9/12, 9/22*

U.S. Cl. 424—245 **7 Claims**

1. A fungicidal composition for agricultural and horticul-

tural use comprising a suitable carrier and a fungicidally effective amount of a mixture consisting essentially of about 0.5 to 2 parts by weight of N-(4-fluorophenyl)-2,3-dichloromaleimide per part of at least one compound selected from the group consisting of a compound expressed by the formula:



(where M represents manganese or zinc, and when M is manganese, zinc may coordinate in the molecules), N-trichloromethylthio-4-cyclohexene-1,2-dicarboxyimide and 8-oxyquinoline copper.

4,066,761

7-ACYL-3-(UREIDOALKYL SUBSTITUTED TETRAZOLYLTHIOMETHYL)CEPHALOSPORINS

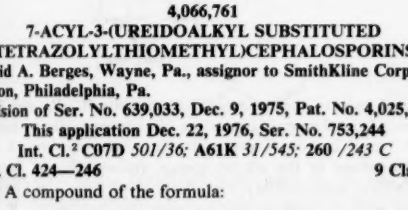
David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 639,033, Dec. 9, 1975, Pat. No. 4,025,626. This application Dec. 22, 1976, Ser. No. 753,244

Int. Cl.[2] **C07D** *501/36;* **A61K** *31/545;* **260** */243 C*

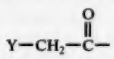
U.S. Cl. 424—246 **9 Claims**

1. A compound of the formula:



in which:

R^1 is an acyl group of the formula:



where:

Y is cyano, aminomethylphenyl, sydnone, thienyl, pyridone or tetrazolyl; and

n is two to five,

or a non-toxic pharmaceutically acceptable salt thereof.

6. A pharmaceutical composition comprising an anti-bacterially effective but nontoxic amount of a compound as claimed in claim 1 and a pharmaceutically acceptable carrier therefor.

4,066,762

DERIVATIVES OF 7-(2-SUBSTITUTED-2-HYDROXYIMINOACETAMIDO)-3-(1-SUBSTITUTED TETRAZOL-5-YLTHIOMETHYL-3-CEPHEM-4-CARBOXYLIC ACID

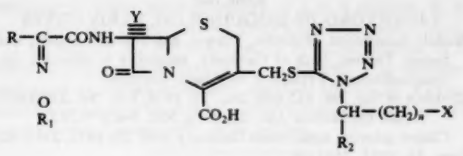
George Lawrence Dunn, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed July 12, 1976, Ser. No. 704,160

Int. Cl.[2] **C07D** *501/36;* **A61K** *31/545;* **C07D** *501/60*

U.S. Cl. 424—246 **18 Claims**

1. A compound of the formula:



in which:

R is thienyl, furyl or phenyl;

R_1 is hydrogen, lower alkyl, benzyl, phenethyl, thienylmethyl or furylmethyl;

n is selected from 0–9;

R_2 is hydrogen or methyl;

X is sulfo, sulfamyl, sulfamino or methylsulfonamido; and

Y is hydrogen or methoxy, together with its alkali metal salts.

15. A pharmaceutical composition having antibacterial activity comprising an active but nontoxic quantity of a compound of claim 1 and a pharmaceutically acdeptable carrier.

16. A method of inducing antibacterial activity in an infected patient comprising administering internally to said patient an effective but nontoxic quantity of a compound of claim 1.

4,066,763

THIAZINOINDOLES USEFUL AS ANTIDEPRESSANTS

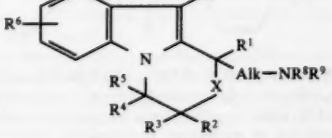
Christopher A. Demerson, Montreal; Leslie G. Humber, Dollard des Ormeaux; George Santroch, Montreal; Thomas A. Dobson, Dollard des Ormeaux, and Ivo Jirkovsky, Montreal, all of Canada, assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada

Division of Ser. No. 593,582, July 7, 1975, Pat. No. 4,012,511, which is a continuation-in-part of Ser. No. 473,646, May 28, 1974, Pat. No. 3,962,236, and Ser. No. 226,287, Feb. 14, 1972, Pat. No. 3,833,575. This application Dec. 13, 1976, Ser. No. 750,293

Int. Cl.[2] **C07D** *513/04;* **A61K** *31/38*

U.S. Cl. 424—246 **3 Claims**

2. A method of treating depression in a mammal which comprise administering to said mammal an antidepressant effective amount from about 0.1 to about 50 milligrams per kilogram of mammal weight per day of a compound of formula



in which R^1 is lower alkyl or lower cycloalkyl; R^2, R^3, R^4 and R^5 are the same or different selected from the group consisting of hydrogen and lower alkyl; R^6 is hydrogen, lower alkyl, hydroxy, lower alkoxy, lower alkanoyloxy, nitro or halo, R^7 is lower alkyl; X is thio; and Alk—NR^8R^9 is an amino(lower)alkyl radical in which Alk is an alkylene selected from the group consisting of $CR^{10}R^{11}$, $CR^{10}R^{11}CR^{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ in which R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are hydrogen or lower alkyl, and R^8 and R^9 are either the same or different selected from the group consisting of hydrogen and lower alkyl, or R^8 and R^9 together with the nitrogen atom to which they are joined form a heterocyclic amine radical selected from the group consisting of 1-pyrrolidinyl, piperidino, morpholino, piperazino, 4-(lower alkyl)-1-piperazinyl and 4-[hydroxy(lower)alkyl]-1-piperazinyl, or a corresponding pharmaceutically acceptable acid addition salt thereof.

4,066,764
1,4-DIHYDRO-2H-ISOQUINOLINE DERIVATIVES

Rudolf Kunstmann, Hofheim, Taunus, and Joachim Kaiser, Bad Soden, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

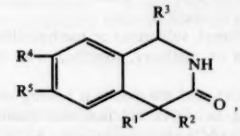
Division of Ser. No. 515,659, Oct. 17, 1974, Pat. No. 3,980,655. This application Apr. 23, 1976, Ser. No. 679,782

Claims priority, application Germany, Oct. 20, 1973, 2352702; Sept. 14, 1974, 2444109

Int. Cl.[2] C07C *413/06;* A61K *31/535*

U.S. Cl. 424—248.54 4 Claims

1. A 1,4-dihydro-2H-isoquinoline compound of the formula



and physiologically tolerated salts thereof, wherein R^1 is hydrogen or straight-chain or branched alkyl of 1 to 6 carbon atoms; R^2 is morpholine-lower alkyl; R_3 is pyridyl, phenyl, or phenyl mono- or di-substituted by halo, nitro, amino, alkanoylamino having 1 to 4 carbon atoms or alkyl having 1 to 4 carbon atoms; and R^4 and R^5, which may be the same or different, are hydrogen or alkoxy having 1 to 4 carbon atoms.

4. A method for treating arrhythmia in a patient suffering therefrom which comprises administering an anti-arrhythmically effective amount of a compound as in claim 1.

4,066,765
ARTHROPODICIDAL FORMAMIDINES

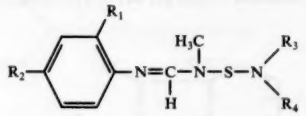
Victor L. Rizzo, Almena Township, Van Buren County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 575,247, May 7, 1975, Pat. No. 3,998,969. This application Sept. 14, 1976, Ser. No. 723,076

Int. Cl.[2] A01N *9/22;* C07D *295/02*

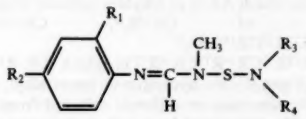
U.S. Cl. 424—248.56 12 Claims

1. A compound of the formula:



wherein R_1 is lower alkyl of from 1 to 4 carbon atoms,; R_2 is hydrogen, halogen or lower alkyl of from 1 to 4 carbon atoms; and R_3 and R_4 taken together are a member selected from the group consisting of piperidino, morpholino, pyrazol-1-yl, tribromopyrazol-1-yl, N-methylpiperazine, pyrrol-1-yl, pyrrolidino, and 2-oxopyrrolidino.

5. A process for controlling arthropodal pest populations which comprises applying to a situs thereof an effective amount of a compound of the formula:



wherein R_1 is lower alkyl of from 1 to 4 carbon atoms; R_2 is hydrogen, halogen or lower alkyl of from 1 to 4 carbon atoms; and R_3 and R_4 taken together are a member selected from the group consisting of piperidino, morpholino, pyrazol-1-yl, tribromopyrazol-1-yl, N-methylpiperazino, pyrrol-1-yl, pyrrolidino, and 2-oxopyrrolidino.

4,066,766
1-OXO-1H-6-SUBSTITUTED PYRIMIDO [1,2-a]QUINOLINE-2-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF AND THEIR USE AS ANTIALLERGY AGENTS

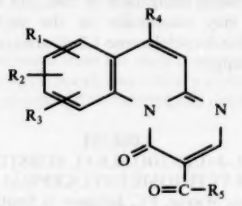
Saul B. Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 554,966, March 3, 1975, abandoned, and Ser. No. 547,227, Feb. 5, 1975, abandoned, and Ser. No. 456,797, April 1, 1974, abandoned. This application Jan. 20, 1976, Ser. No. 650,713

Int. Cl.[2] A61K *31/505;* C07D *471/04*

U.S. Cl. 424—251 25 Claims

1. A compound of the formula



wherein each of the benzenoid substituents R_1, R_2 and R_3 is selected from the group consisting of hydrogen, alkoxy having from 1 to 5 carbon atoms, carboalkoxy having from 1 to 5 carbon atoms in the alkoxy group, fluoro, chloro, bromo, methylthio, methylsulfinyl and alkyl having from 1 to 5 carbon atoms; with the proviso that no more than two of R_1, R_2 and R_3 are bulky branched chain alkyl or branched chain alkoxy groups and when two of said R_1, R_2 and R_3 are bulky groups they are located on non-adjacent positions;

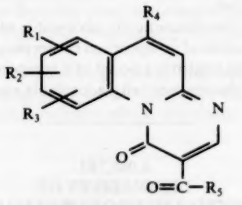
R_2 and R_3 when taken together are selected from the group consisting of 1,3-butadienyl and alkylenedioxy of 1 to 2 carbon atoms;

R_4 is selected from the group consisting of chloro, bromo and OR_4' wherein OR_4' is selected from the group consisting of alkoxy having from 1 to 5 carbon atoms, alkenyloxy of 3 to 4 carbon atoms and alkynyloxy of 3 to 4 carbon atoms;

R_5 is selected from the group consisting of hydroxy, alkoxy having from 1 to 5 carbon atoms and hydroxy substituted alkoxy having from 2 to 5 carbon atoms;

and the pharmaceutically-acceptable cationic salts of those compounds wherein R_5 is hydroxy.

14. The method of treating bronchial asthma in a mammalian subject requiring such treatment which comprises administering to said subject an anti-bronchial effective amount of a compound having the formula



wherein each of the benzenoid substituents R_1, R_2 and R_3 is selected from the group consisting of hydrogen, alkoxy having from 1 to 5 carbon atoms, carboalkoxy having from 1 to 5 carbon atoms in the alkoxy group, fluoro, chloro, bromo, methylthio, methylsulfinyl and alkyl having from 1 to 5 carbon atoms; with the proviso that no more than two of R_1, R_2 and R_3 are bulky branched chain alkyl or branched chain alkoxy groups and when two of said R_1, R_2 and R_3 are bulky groups they are located on non-adjacent positions;

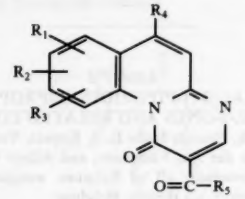
R_2 and R_3 when taken together are selected from the group consisting of 1,3-butadienyl and alkylenedioxy of 1 to 2 carbon atoms;

R_4 is selected from the group consisting of chloro, bromo and OR_4' wherein OR_4' is selected from the group consisting of alkoxy having from 1 to 5 carbon atoms, alkenyloxy of 3 to 4 carbon atoms and alkynyloxy of 3 to 4 carbon atoms;

R_5 is selected from the group consisting of hydroxy, alkoxy having from 1 to 5 carbon atoms and hydroxy substituted alkoxy having from 2 to 5 carbon atoms;

and the pharmaceutically-acceptable cationic salts of those compounds wherein R_5 is hydroxy.

21. A pharmaceutical composition useful in treating bronchial asthma in a mammalian subject requiring such treatment which comprises a pharmaceutically-acceptable carrier and a compound of the formula



wherein each of the benzenoid substituents R_1, R_2 and R_3 is selected from the group consisting of hydrogen, alkoxy having from 1 to 5 carbon atoms, carboalkoxy having from 1 to 5 carbon atoms in the alkoxy group, fluoro, chloro, bromo, methylthio, methylsulfinyl and alkyl having from 1 to 5 carbon atoms; with the proviso that no more than two of R_1, R_2 and R_3 are bulky branched chain alkyl or branched chain alkoxy groups, and when two of said R_1, R_2 and R_3 are bulky groups they are located on nonadjacent positions;

R_2 and R_3 when taken together are selected from the group consisting of 1,3-butanediol and alkylenedioxy of 1 to 2 carbon atoms;

R_5 is selected from the group consisting of hydroxy, alkoxy having from 1 to 5 carbon atoms; and hydroxy substituted alkoxy having from 2 to 5 carbon atoms;

R_4 is selected from the group consisting of chloro, bromo and OR_4' wherein OR_4' is selected from the group consisting of alkoxy having from 1 to 5 carbon atoms, alkenyloxy of 3 to 4 carbon atoms and alkynyloxy of 3 to 4 carbon atoms;

and the pharmaceutically-acceptable cationic salts of those compounds wherein R_5 is hydroxy.

4,066,767

8-(1H-TETRAZOL-5-YL)-11H-PYRIDO[2,1-B]QUINAZOLIN-11-ONES AND METHOD OF TREATING BRONCHIAL ASTHMA USING THEM

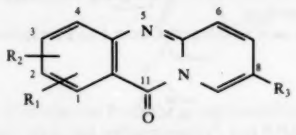
Charles F. Schwender, Lebanon, and Brooks R. Sunday, Hackettstown, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 1, 1976, Ser. No. 737,878

Int. Cl.² A61K *31/505;* **C07D** *471/04*

U.S. Cl. 424—251 **7 Claims**

1. A compound of the formula:



I.

wherein R_1 and R_2 are hydrogen, halogen, hydroxy, methylenedioxy or lower alkyl or alkoxy of 1 to 4 carbons; R_3 is 5-tetrazolyl and the pharmaceutically acceptable salts thereof.

7. A method for the treatment of bronchial asthma in a mammal suffering from asthma which comprises the administration of an anti-asthmatically effective amount of a compound according to claim **1** at an adult human dose of 0.001–20 mg/kg orally, parenterally, or by aerosol.

4,066,768

DERIVATIVES OF 1-PHENOXY-3-AMINO-PROPAN-2-OL

Thomas Raabe, Rodenbach; Otto Gräwinger, Frankfurt am Main; Josef Scholtholt, Mittelbuchen; Rolf-Eberhard Nitz, Bergen-Enkheim, and Eckhard Schraven, Frankfurt am Main, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

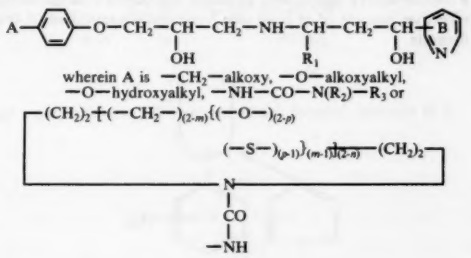
Continuation-in-part of Ser. No. 531,344, Dec. 10, 1974. This application Mar. 24, 1976, Ser. No. 669,995

Claims priority, application Luxembourg, Dec. 27, 1973, 34590

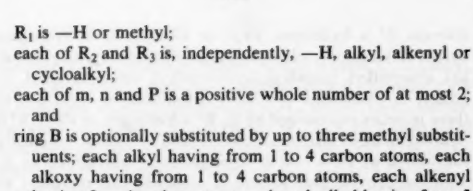
Int. Cl.² A61K *31/44;* **C07D** *213/36*

U.S. Cl. 424—263 **12 Claims**

1. A compound of the formula



wherein A is $-CH_2-$alkoxy, $-O-$alkoxyalkyl, $-O-$hydroxyalkyl, $-NH-CO-N(R_2)-R_3$ or



R_1 is —H or methyl;

each of R_2 and R_3 is, independently, —H, alkyl, alkenyl or cycloalkyl;

each of m, n and P is a positive whole number of at most 2; and

ring B is optionally substituted by up to three methyl substituents; each alkyl having from 1 to 4 carbon atoms, each alkoxy having from 1 to 4 carbon atoms, each alkenyl having 3 or 4 carbon atoms and cycloalkyl having from 5 to 7 carbon atoms;

or a pharmaceutically-acceptable acid-addition salt thereof.

3. A pharmaceutically-acceptable β-adrenergic-blocking composition comprising diluent or excipient and an effective concentration of a compound according to claim **1**.

4,066,769

3,3'-(2,6-PYRIDINEDIYL) DI-5-ISOXAZOLE CARBOXYLIC ACIDS, SALTS, AND ESTERS, COMPOSITIONS AND METHODS OF USE THEREOF

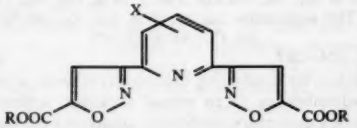
John B. Wright, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 23, 1976, Ser. No. 753,719

Int. Cl.² C07D *413/14*

U.S. Cl. 424—263 **20 Claims**

1. A compound of the formula



wherein

X is hydrogen, alkyl of one to six carbon atoms, inclusive, alkoxy of one to six carbon atoms, inclusive, phenyl, cyano, nitro, trifluoromethyl, fluoro, chloro or bromo;

R is hydrogen, alkyl of one to eight carbon atoms, inclusive, and a physiologically acceptable metal or amine cation.

20. 3,3-(2,6-Pyridinediyl)di-5-isoxazolecarboxylic acid according to claim 1.

4,066,770
3-PYRIDYLISOXAZOLIDINE FUNGICIDES

Clive B. C. Boyce, Herne Bay, and Shirley B. Webb, Faversham, both of England, assignors to Shell Oil Company, Houston, Tex.

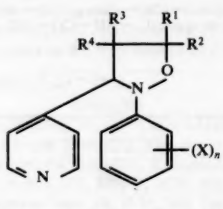
Filed Aug. 26, 1976, Ser. No. 717,803

Claims priority, application United Kingdom, Sept. 2, 1975, 36093/75

Int. Cl.[2] A01N *9/22*

U.S. Cl. 424—263 **3 Claims**

1. A fungicidal composition comprising a carrier, optionally a surface-active agent, and, as active ingredient a fungicidally effective amount of at least one 3-pyridylisoxazolidine of the formula



wherein R^1 is hydrogen, alkyl or alkenyl; R^2 is hydrogen, cyano, alkyl, alkoxy, alkoxycarbonyl, alkanoyloxy, alkylthioalkyl, cyanoalkyl, haloalkyl, hydroxyalkyl, benzyloxyalkyl, or phenyl or phenylthio optionally substituted by from one to three moieties represented by X; R^3 is hydrogen or alkyl; R^4 is hydrogen, alkyl, alkoxycarbonyl, cyano or phenyl optionally substituted by from one to three moieties represented by X; with the proviso that R^1 and R^3 together can represent an alkylene moiety of from one to six carbon atoms optionally substituted by alkyl; X is halogen, nitro, cyano, alkyl, alkoxy or phenyl; n is zero, one, two or three, with the further provisos that each alkyl and alkylene moiety contains from one to six carbon atoms; and each alkenyl moiety contains from three to six carbon atoms.

4,066,771
SUBSTITUTED PHENOXYALKYL QUATERNARY AMMONIUM COMPOUNDS AS ANTIARRHYTHEMIC AGENTS

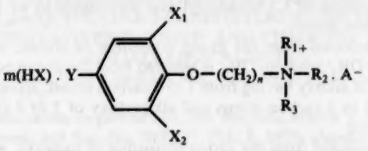
Stanley J. Strycker, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 484,525, July 1, 1974, Pat. No. 3,932,664. This application Jan. 12, 1976, Ser. No. 648,547

Int. Cl.[2] A61K *31/445*

U.S. Cl. 424—267 **8 Claims**

5. A method for combatting cardiac arrhythmias which comprises administering to an animal a cardiac antiarrhythmic amount of a quaternary ammonium compound corresponding to the formula:



wherein Y represents amino, loweralkylamino or dioweralkylamino; R_1, R_2 and R_3 taken together represent a quinuclidine residue; X_1 and X_2 both represent halogen; A^- represents a stoichiometric equivalent quantity of a pharmaceutically-acceptable anion; *n* represents one of the integers 2, 3 or 4; HX represents a stoichiometric equivalent quantity of a pharmaceutically-acceptable acid; and *m* represents one of the integers zero and one.

4,066,772
1,3-DIHYDRO-1-[3-(1-PIPERIDINYL)PROPYL]-2H-BENZIMIDAZOL-2-ONES AND RELATED COMPOUNDS

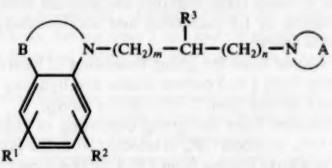
Jan Vandenberk, Beerse; Ludo E. J. Kennis, Vosselaar; Marcel J. M. C. Van der Aa, Vosselaar, and Albert H. M. Th. Van Heertum, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 597,793, July 21, 1975, abandoned. This application May 17, 1976, Ser. No. 687,139

Int. Cl.[2] A61K *31/445*; C07D *401/06, 401/14*

U.S. Cl. 424—267 **15 Claims**

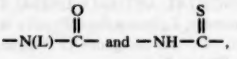
4. A pharmaceutical composition comprising an inert carrier material and as an active ingredient an effective antiemetic amount of a chemical compound selected from the group consisting of a 1-(benzazolylalkyl)piperidine derivative having the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein:

R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

B is a member selected from the group consisting of the bivalent radicals



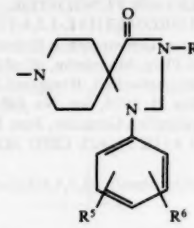
said L being a member selected from the group consisting of hydrogen, lower alkyl, lower alkylcarbonyl and lower alkenyl, and said bivalent radicals being attached to the benzene nucleus with their heteroatom;

R^3 is a member selected from the group consisting of hydrogen and methyl;

m and *n* are each an integer of from 1 to 2 inclusive; and the radical

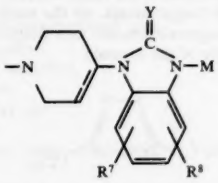
is a member selected from the group consisting of:

a. a radical having the formula:



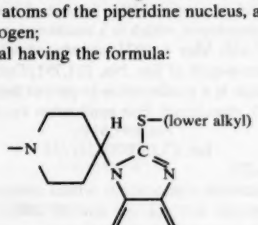
wherein R^4 is a member selected from the group consisting of hydrogen and lower alkyl; and R^5 and R^6 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

b. a radical having the formula:



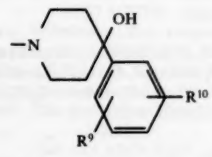
wherein R^7 and R^8 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl; Y is a member selected from the group consisting of O and S; M is a member selected from the group consisting of hydrogen, lower alkyl and lower alkylcarbonyl; and the dotted line indicates that the double bond between the 3 and 4 carbon atoms of the piperidine nucleus is optional, provided that when said Y is S, then there is a single bond between said 3 and 4 carbon atoms of the piperidine nucleus, and the said M is hydrogen;

c. a radical having the formula:



wherein R^7 and R^8 are each independently selected from the group consisting of hydrogen, halo, lower alkyl, and trifluoromethyl; and

d. a radical having the formula:



wherein R^9 is selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl, and R^{10} is selected from the group consisting of hydrogen and halo.

4,066,773

N^2-ARYLSULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto; Akiko Hijikata, both of Kobe; Ryoji Kikumoto, Tokyo; Yoshikuno Tamao, Yokohama; Kazuo Ohkubo, Machida; Tohru Tezuka, Yokohama, and Shinji Tonomura, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo and Shosuke Okamoto, both of Japan

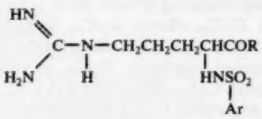
Continuation-in-part of Ser. No. 653,217, Jan. 28, 1976, and Ser. No. 713,486, Aug. 11, 1976, and Ser. No. 671,436, March 29, 1976, and Ser. No. 703,704, July 8, 1976, said Ser. No. 671,436, is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,745

Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635; Mar. 5, 1975, 50-026768; Mar. 11, 1975, 50-029357; Mar. 11, 1975, 50-029358

Int. Cl.[2] **A61K** *31/445;* **C07D** *211/16*

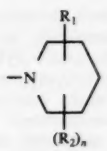
U.S. Cl. 424—267 **6 Claims**

1. An N^2-arylsulfonyl-L-argininamide having the formula (I):



(I)

or a pharmaceutically acceptable salt thereof, wherein R is



wherein R_1 is $—COOR_3$ wherein R_3 is hydrogen, C_1-C_{10} alkyl, C_6-C_{10} aryl, C_7-C_{12} aralkyl or 5-indanyl; each R_2 independently is hydrogen, C_1-C_{10} alkyl, phenyl, C_1-C_5 alkoxy, C_2-C_6 alkoxycarbonyl, or carboxy; *n* is an integer of 1 to 4, R_1 is substituted into the piperidine ring at the 2 to 3 position; and R_2 is substituted into the piperidine ring at the 2, 3, 4, 5 or 6 position;

and Ar is naphthyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1-C_{10} alkyl and C_2-C_{20} dialkylamino,

and at least one substituent selected from the group consisting of C_1-C_{10} alkoxy, sulfoamino, carbamoyl, C_3-C_{10} N,N-dialkylcarbamoyl, amino, C_1-C_{10} alkylamino, mercapto, C_1-C_{10} alkylthio, C_7-C_{10} aralkyl, carbonyl, C_2-C_{10} alkoxycarbonyl, C_2-C_{10} carboxyalkyl, C_1-C_{10} acylamino, C_2-C_{10} alkylcarbonyl, C_1-C_{10} hydoxyalkyl, C_1-C_{10} haloalkyl and phenyl optionally substituted with at least one hydroxy, C_1-C_5 alkoxy, or mixtures thereof;

naphthyl substituted with at least one C_1-C_5 alkoxy and at least one substituent selected from the group consisting of sulfoamino, carbamoyl, C_3-C_{10} N,N-dialkylcarbamoyl, amino, C_1-C_{10} alkylamino, mercapto, C_1-C_{10} alkylthio, C_7-C_{12} aralkyl, carboxyl, C_2-C_{10} alkoxycarbonyl, C_2-C_{10} carboxyalkyl, C_1-C_{10} acylamino, C_2-C_{10} alkylcarbonyl, C_1-C_{10} hydroxyalkyl, C_1-C_{10} haloalkyl and phenyl optionally substituted with at least one hydroxy, C_1-C_5 alkoxy or mixtures thereof;

naphthyl substituted with at least one substituent selected from the group consisting of sulfoamino, carbamoyl, C_3-C_{10} N,N-dialkylcarbamoyl, amino, C_1-C_{10} alkylamino, mercapto, C_1-C_{10} alkylthio, C_7-C_{12} aralkyl, carboxyl, C_2-C_{10} alkoxycarbonyl, C_2-C_{10} carboxyalkyl, C_1-C_{10} acylamino, C_2-C_{10} alkylcarbonyl, C_1-C_{10} hydroxyalkyl, C_1-C_{10}

haloalkyl and phenyl optionally substituted with at least one hydroxy, C_1-C_5 alkoxy or mixtures thereof;

5,6,7,8-tetrahydronaphthyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1-C_{10} alkyl, C_1-C_{10} alkoxy, sulfoamino, carbamoyl, C_3-C_{10} N,N-dialkylcarbamoyl, amino, C_1-C_{10} alkylamino, mercapto, C_1-C_{10} alkylthio, C_7-C_{12} aralkyl, carboxyl, C_2-C_{10} alkoxycarbonyl, C_2-C_{10} carboxyalkyl, C_1-C_{10} acylamino, C_2-C_{10} alkylcarbonyl, C_1-C_{10} hydroxyalkyl, C_1-C_{10} haloalkyl and phenyl optionally substituted with at least one hydroxy, C_1-C_5 alkoxy or mixtures thereof;

C_7-C_{12} aralkyl, 9,10-dihydroanthryl, 5,6,7,8-tetrahydroanthryl, 9,10-dihydrophenanthryl, 1,2,3,4,5,6,7,8-octahydrophenanthryl, indenyl, indanyl, fluorenyl, acenaphthenyl, phenylthiophenyl, 1,2-ethylenedioxyphenyl, chromanyl, isochromanyl, 2,3-dihydrobenzofuranyl, 1,3-dihydroisobenzofuranyl, 2,3-ethylenedioxynaphthyl, xanthenyl, thioxanthenyl, 1,2-trimethylenedioxyphenyl, 2H-chromenyl, 3,4-dehydro-1-isochromanyl, 4H-chromenyl, indolinyl or isoindolinyl, group, any of which is unsubstituted or substituted with one or more groups selected from the group consisting of halo, nitro, cyano, hydroxy, C_1-C_{10} alkyl, C_1-C_{10} alkoxy, C_2-C_{20} dialkylamino, sulfoamino, carbamoy, C_3-C_{10} N,N-dialkylcarbamoyl, amino, C_1-C_{10} alkylamino, metcapto, C_1-C_{10} alkylthio, C_7-C_{12} aralkyl, carboxyl, C_2-C_{10} alkoxycarbonyl, C_2-C_{10} carboxyalkyl, C_1-C_{10} acylamino, C_2-C_{10} alkylcarbonyl, C;hd 1-C_{10} hydroxyalkyl, C_1-C_{10} haloalkyl, oxo and phenyl optionally substituted with at least one hydroxy, C_1-C_5 alkoxy or mixtures thereof;

naphthoquinonyl, anthryl, phenanthryl, pentalenyl, heptalenyl, azulenyl, biphenylenyl, αs-indacenyl, s-indacenyl, acenaphthylenyl, phenylcarbonylphenyl, phenoxyphenyl, benzofuranyl, isobenzofuranyl, benzo [b] thienyl, isobenzothienyl, oxanthrenyl, thianthrenyl, dibenzofuranyl, dibenzothienyl, phenoxathiinyl, indolyl, IH-indazolyl, 1,8-naphthyridinyl, carbazolyl, or benzimidazolyl group, any of which is unsubstituted or substituted with one or more groups selected from the group consisting of halo, nitro, cyano, hydroxy, C_1-C_{10} alkyl, C_1-C_{10} alkoxy, C_2-C_{20} dialkylamino, sulfoamino, carbamoyl, C_3-C_{10} alkyl, C_1-C_{10} alkoxy, C_2-C_{20} dialkylamino, sulfoamic, carbamoyl, C_3-C_{10} N,N-dalkylcarbamoyl, amino, C_1-C_{10} alkylamino, mercapto, C_1-C_{10} alkylthio, C_7-C_{12} aralkyl, carboxyl, C_2-C_{10} alkoxycarbonyl, C_2-C_{10} carboxyalkyl, C_1-C_{10} acylamino, C_2-C_{10} alkylcarbonyl, C_1-C_{10} hydroxyalkyl, C_1-C_{10} haloalkyl and phenyl optionally substituted with at least one hydroxy, C_1-C_5 alkoxy or mixtures thereof.

4,066,774

METHOD OF KILLING INSECTS EMPLOYING A CERTAIN TRIAZOLE

Joel L. Kirkpatrick, Overland Park, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Mar. 1, 1976, Ser. No. 662,171
Int. Cl.[2] A01N 9/22
U.S. Cl. 424—269 **1 Claim**

1. The method of selectively killing corn rootworms in the presence of growing corn plants comprising applying to the locus of the corn rootworms an effective amount of 1-N,N-dimethylcarbamyl-3-tert.butyl-5-methylthio-1,2,4-triazole.

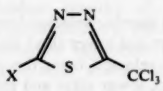
4,066,775

CERTAIN FUNGITOXIC 2-HALO-5-TRICHLOROMETHYL-1,3,4-THIADIAZOLES

Ernst-Heinrich Pommer, Limburgerhof; Helmut Hagen, Frankenthal, and Helmut Fleig, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Germany

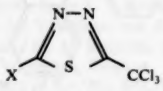
Filed May 21, 1976, Ser. No. 688,761
Claims priority, application Germany, June 12, 1975, 2526308
Int. Cl.[2] A61K 31/425; C07D 285/12
U.S. Cl. 424—270 **4 Claims**

1. A 2-halo-5-trichloromethyl-1,3,4-thiadiazole of the formula



where X denotes Cl or Br.

4. A process for combatting fungi wherein the objects to be protected against fungus attack, or the fungi themselves, are treated with a fungitoxic amount of a 2-halo-5-trichloromethyl-1,3,4-thiadiazole of the formula



where X denotes Cl or Br.

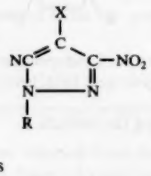
4,066,776

ANTI-BACTERIAL COMPOSITIONS CONTAINING CERTAIN 3-NITROPYRAZOLES

Reuben G. Jones, Cedar City, Utah, and Norman H. Terando, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 561,139, March 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 477,118, June 6, 1974, abandoned, which is a continuation-in-part of Ser. No. 357,135, May 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 211,791, Dec. 23, 1971, abandoned, which is a continuation-in-part of Ser. No. 124,463, March 15, 1971, abandoned. This application June 18, 1976, Ser. No. 697,516
Int. Cl.[2] C07D 231/16
U.S. Cl. 424—270 **30 Claims**

1. An antibacterial composition which comprises a physiologically-acceptable inert carrier and an antibacterially-effective amount of a compound of the formula



wherein R represents

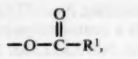
A. C_3-C_4 epoxyalkyl,

B. hydrogen,

C. C_1-C_{10} alkyl, C_2-C_{10} alkenyl, C_3-C_{10} alkynyl, C_3-C_{10} cycloalkyl, cyclopropylmethyl, C_3-C_{10} cycloalkenyl, C_2-C_{10} alkyl mono- or disubstituted with halo or C_1-C_3 alkoxy, or C_1-C_{10} alkyl monosubstituted with

1. mercapto,
2. carboxamido,
3. keto oxygen,
4. hydroxy,
5. phthalimido,
6. C_1-C_3 alkylthio,

7. C_1–C_3 alkylsulfonyl,
8. C_1–C_3 alkanoyl,
9. phenyl,
10. phenyl monosubstituted with
   a. C_1–C_3 alkyl,
   b. C_1–C_3 haloalkyl,
   c. hydroxy, or
   d. halo,



(11)

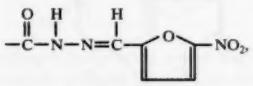
wherein R^1 represents
   a. C_1–C_3 alkyl,
   b. C_1–C_3 alkoxy,
   c. C_1–C_3 haloalkyl,
   d. amino,
   e. C_3–C_6 cycloalkyl,
   f. phenoxy,
   g. phenyl, or
   h. phenyl monosubstituted with
      1. C_1–C_3 alkyl,
      2. C_1–C_3 haloalkyl,
      3. halo, or
      4. hydroxy, or
   12. cyano, or

D. 4-nitrophenyl, 5-nitro-2-thiazolyl, or 3-nitro-2-pyridyl; and

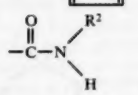
X represents

A. 5-methylamino-1,3,4-thiadiazol-2-yl,

B. cyano,

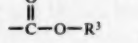


(C)



(D)

wherein R^2 represents
   1. hydrogen, or
   2. C_1–C_6 alkyl; or



(E)

wherein R^3 represents
   C_1–C_6 alkyl;

provided that a C_1 alkyl R group is substituted only with phenyl or substituted phenyl.

30. An antibacterial composition which comprises a physiologically-acceptable inert carrier and an antibacterially-effective amount of 1,1'-(2,5-cyclohexadien-1,4-ylene)-bis-(3-nitro-4-pyrazolecarboxamide).

4,066,777

METHOD FOR PROTECTING LOCI AGAINST FUNGI AND MITES

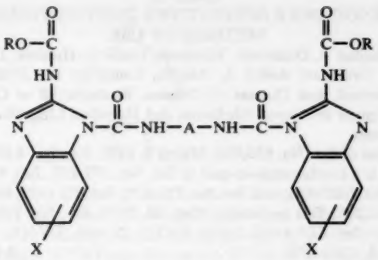
Bruce Ivor Dittmar, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 229,559, Feb. 25, 1972, Pat. No. 3,970,668, which is a continuation-in-part of Ser. No. 841,987, July 15, 1969, abandoned. This application May 17, 1976, Ser. No. 687,177

Int. Cl.[2] A01N *9/22*

U.S. Cl. 424—273 R **5 Claims**

1. The method of preventing injury due to mites or fungi consisting essentially of applying to the locus to be protected an effective amount of a compound of the formula



wherein

the R's can be the same or different and are methyl, ethyl, isopropyl or sec-butyl;

X is hydrogen, halogen, methyl or methoxy;

A is a difunctional group of 1 to 18 carbon atoms selected from

alkylene;

alkylene substituted by oxa, N-methylaza or thia;

alkenylene;

cycloalkylene;

cycloalkenylene;

bis (cyclohexylene)methylene;

alkylenated alkylcyclohexylene;

alkylated cyclohexylene;

alkylenated cyclohexylene;

bicycloalkylene;

phenylene;

methylated phenylene; and

bis(phenylene) methylene.

4,066,778

TETRAHYDROIMIDAZOLE COMPOUNDS USEFUL AS PHARMACEUTICALS

Kuppuswamy Nagarajan; Vishwa Prakash Arya, and Thomas George, all of Bombay, India, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

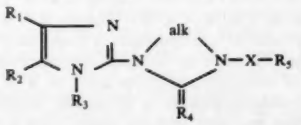
Division of Ser. No. 508,603, Sept. 23, 1974, Pat. No. 3,976,778. This application June 8, 1976, Ser. No. 694,115

Claims priority, application Switzerland, Sept. 24, 1973, 13667/73

Int. Cl.[2] A01N *9/22;* **C07D** *233/02, 235/00;* **A61K** *31/415*

U.S. Cl. 424—273 R **13 Claims**

1. A compound of the formula



wherein one of the groups R_1 and R_2 is a hydrogen or lower alkyl and the other a nitro group, R_3 is a lower alkyl, hydroxy-lower alkyl, lower-alkoxy-lower-alkyl, lower-alkylsulphonyl-lower-alkyl or amino-lower-alkyl, R_4 is an oxo or thioxo group, X is a sulphinyl or sulphonyl group and R_5 is a lower alkyl, aryl, amino, alkylamino or diloweralkylamino group and alk is 1,2-ethylene, their pharmaceutically acceptable salts or N-oxides.

11. An antibacterial active composition useful as gram negative active agent comprising an antibacterially effective amount of a compound of claim 1 or a pharmaceutically acceptable acid addition salt thereof and a pharmaceutically acceptable diluent or carrier therefore.

4,066,779

PYRANOINDOLE DERIVATIVES, COMPOSITIONS AND METHOD OF USE

Christopher A. Demerson, Montreal; Leslie G. Humber, Dollard des Ormeaux; André A. Asselin, Lemoyne; Ivo Jirkovsky, Montreal, and Thomas A. Dobson, Roxboro, all of Canada, assignors to Ayerst, McKenna and Harrison Ltd., Montreal, Canada

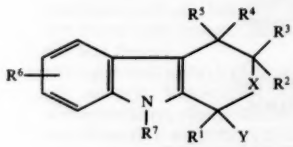
Division of Ser. No. 555,906, March 5, 1975, Pat. No. 4,003,913, which is a continuation-in-part of Ser. No. 377,837, July 9, 1973, Pat. No. 3,880,853, and Ser. No. 217,627, Jan. 13, 1972, Pat. No. 3,852,285. This application Oct. 28, 1976, Ser. No. 736,613

Int. Cl.[2] A61K *31/40, 31/535, 31/495, 31/445*

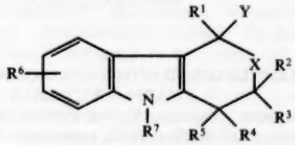
U.S. Cl. 424—274 8 Claims

1. A method of preventing and treating ulcers in warm blooded animals which comprises:

administering to said mammal an effective dose of from about 0.1 to about 50 milligrams per kilogram of mammal weight per day of a compound selected from those of the formulae I and Ia



I



Ia

in which R^1 is lower alkyl or lower cycloalkyl; R^2, R^3, R^4 and R^5 are the same or different selected from the group consisting of hydrogen and lower alkyl; R^6 is hydrogen, lower alkyl, hydroxy, lower alkoxy, lower alkanoyloxy, nitro or halo; R^7 is hydrogen, lower alkyl, lower alkenyl, propargyl, phenyl(lower)alkyl or an amino(lower)alkyl radical of formula —Alk—NR^8R^9 wherein Alk is an alkylene selected from the group consisting of $CR^{10}R^{11}CR^{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$, and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ wherein R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are hydrogen or lower alkyl and R^8 and R^9 are either the same or different selected from the group consisting of hydrogen and lower alkyl, or R^8 is lower alkyl and R^9 is p-chlorophenacyl, or R^8 and R^9 together with the nitrogen atom to which they are joined form a heterocyclic amine radical selected from the group consisting of 1-pyrrolidinyl, piperidino, morpholino, 1 piperazinyl, 4-(lower alkyl)-1-piperazinyl and 4-[hydroxy(lower)alkyl]-1-piperazinyl; X is oxy: and Y is lower alkyl, phenyl(lower)alkyl or an amino(lower)alkyl radical of formula —Alk—NR^8R^9 wherein Alk is an alkylene selected from the group consisting of $CR^{10}R^{11}$, $CR^{10}R^{11}CR^{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ wherein R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are hydrogen or lower alkyl and R^8 and R^9 are as defined herein; with the proviso that at least one of R^7 and Y is —Alk—NR^8R^9 and that in the compounds of formula Ia, Y is —Alk NR^8R^9 as defined herein; and the corresponding acid addition salt with a pharmaceutically acceptable acid.

4,066,780

PYRANOINDOLE DERIVATIVES AS ANTIULCER AGENTS

Christopher A. Demerson, Montreal; Leslie G. Humber, Dollard des Ormeaux; Andre A. Asselin, Lemoyne; Ivo Jirkovsky, Montreal, and Thomas A. Dobson, Roxboro, all of Canada, assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada

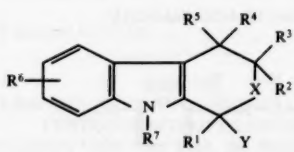
Division of Ser. No. 555,906, March 5, 1975, Pat. No. 4,003,913, and a continuation-in-part of Ser. No. 377,837, July 9, 1973, Pat. No. 3,880,853, which is a continuation-in-part of Ser. No. 217,627, Jan. 13, 1972, Pat. No. 3,852,285. This application Oct. 28, 1976, Ser. No. 736,606

Int. Cl.[2] A61K *31/40, 31/535, 31/495, 31/445*

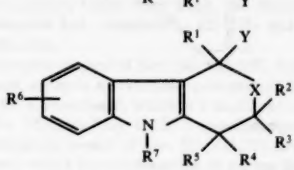
U.S. Cl. 424—274 4 Claims

1. A method of preventing and treating ulcers in warm blooded animals which comprises:

administering to said mammal an effective dose of from about 0.1 milligram to about 50 milligrams per kilogram of mammal weight per day of a compound selected from those of the formulae I and Ia



I



Ia

in which R^1 is lower alkyl or lower cycloalkyl; R^2, R^3, R^4 and R^5 are the same or different selected from the group consisting of hydrogen and lower alkyl; R^6 is hydrogen, lower alkyl, hydroxy, lower alkoxy, lower alkanoyloxy, nitro or halo; R^7 is hydrogen, lower alkyl, lower alkenyl, propargyl, phenyl(lower)alkyl or an amino(lower)alkyl radical of formula —Alk-NR^8R^9 wherein Alk is an alkylene selected from the group consisting of $CR^{10}R^{11}CR^{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$, and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ wherein R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are hydrogen or lower alkyl and R^8 and R^9 are either the same or different selected from the group consisting of hydrogen and lower alkyl, or R^8 is lower alkyl and R^9 is p-chlorophenacyl, or R^8 and R^9 together with the nitrogen atom to which they are joined form a heterocyclic amine radical selected from the group consisting of 1-pyrrolidinyl, piperidino, morpholino, 1 piperazinyl, 4-(lower alloyl) 1-piperazinyl and 4-[hydroxy(lower)alkyl]-1-piperazinyl; X is oxy: and Y is lower alkyl, phenyl(lower)alkyl or an amino(lower)alkyl radical of formula —Alk-NR^8R^9 wherein Alk is an alkylene selected from the group consisting of $CR^{10}R^{11}$,$CR^{10}R^{11}CR^{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ wherein R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are hydrogen or lower alkyl and R^8 and R^9 are as defined herein; with the proviso that at least one of R^7 and Y is —Alk-NR^8R^9 and that in the compounds of formula Ia, Y is —Alk NR^8R^9 as defined herein; and the corresponding acid addition salt with a pharmaceutically acceptable acid.

4,066,781

MITICIDAL METHOD

Hajime Shibuya, Komae, and Shiroh Shirato, Tokyo, both of Japan, assignors to Kaken Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1977, Ser. No. 763,234

Int. Cl.[2] A01N *9/28;* **A61K** *31/35*

U.S. Cl. 424—283 **3 Claims**

1. A method for destroying mites which comprises applying a composition comprising a miticidally effective amount of Salinomycin in combination with a carrier therefor, to imagines, larvae or ova of mites.

4,066,782

ANTIMICROBIAL (2-NITRO-3-BENZOFURANYL)PHENYLACETIC ACIDS

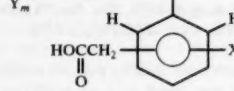
Robert A. Scherrer, White Bear Lake, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Continuation-in-part of Ser. No. 616,276, Sept. 24, 1975, abandoned. This application Sept. 20, 1976, Ser. No. 724,716

Int. Cl.[2] A61K *31/35;* **C07D** *307/82*

U.S. Cl. 424—285 **8 Claims**

1. A compound of the formula



wherein X is halogen, lower alkyl, lower alkoxy or trifluoromethyl, Y is methyl, methoxy or halogen and *m* and *n* are independently 0, 1 or 2, or a lower alkyl ester, diethylaminoethyl ester, 2-hydroxyethyl ester, glyceryl ester or methoxymethyl ester or pharmaceutically acceptable salt thereof.

7. A method for inhibiting or arresting the growth of microorganisms whch comprises contacting said microorganisms with an effective amount of a compound of claim 1.

4,066,783

INSECTICIDAL AND ACARICIDAL METAL HALIDE COMPLEXES OF 4-CYANO-2,2-DIMETHYLBUTYRALDOXIME-N-METHYLCARBAMATE

William Arthur Henderson, Jr., Stamford, Conn., and Fausto Ramirez, Goshen, Va., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 455,481, March 27, 1974, Pat. No. 3,991,092. This application Aug. 11, 1975, Ser. No. 603,887

Int. Cl.[2] A01N *9/00*

U.S. Cl. 424—289 **13 Claims**

1. A method for controlling insects and acarina which comprises: exposing said insects and acarina to an insecticidally and acaricidally effective amount of a solid zinc, cobalt or cupric halide complex of 4-cyano-2,2-dimethylbutyraldoxime-N-methylcarbamate.

4,066,784

TROPONE DERIVATIVES

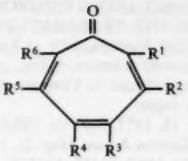
Jehan F. Bagli, Kirkland, and Tibor Bogri, Montreal, both of Canada, assignors to Ayerst, McKenna and Harrison Ltd., Montreal, Canada

Filed June 17, 1976, Ser. No. 697,295

Int. Cl.[2] C07C *153/09, 103/32, 55/06;* **A61K** *31/215*

U.S. Cl. 424—305 **6 Claims**

1. A compound of formula I



(I)

in which R^1, R^2, R^3, R^4, R^5 and R^6 are the same or different selected from the group consisting of hydrogen; halo, trifluoromethyl; lower alkoxy; lower alkyl; phenyl; hydroxy; phenoxy; mercapto; NR^7R^8 wherein each of R^7 and R^8 is hydrogen or lower alkyl; and a radical of formula $Y\text{-}CR^9R^{10}\text{-}COOR^{11}$ wherein Y is NR^{12} wherein R^{12} is hydrogen or lower alkyl, R^9 and R^{10} together are oxo and R^{11} is hydrogen or lower alkyl, with the proviso that one, two or three of R^1, R^2, R^3, R^4, R^5 and R^6 must be a radical of formula $Y\text{-}CR^9R^{10}\text{-}COOR^{11}$ wherein Y, R^9, R^{10} and R^{11} are as defined in each instance herein; and with the additional proviso that when R^1 and/or R^4 is a radical of formula $Y\text{-}CR^9R^{10}\text{-}COOR^{11}$ wherein Y is NR^{12} wherein R^{12} is as defined herein, R^9 and R^{10} together are oxo and R^{11} is as defined herein, then at least one of R^2, R^3, R^5 and R^6 must be a radical of formula $Y\text{-}CR^9R^{10}\text{-}COOR^{11}$ wherein Y, R^9, R^{10} and R^{11} are as defined in each instance herein; or a therapeutically acceptable salt thereof.

4,066,785

ESTERS OF α-HYDROPEROXY-BIS-P-HALO-PHENYLACETIC ACIDS

Yair Sprinzak, Rehovoth, Israel, assignor to Yeda Research & Development Co., Ltd., Rehovot, Israel

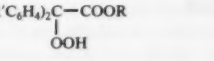
Division of Ser. No. 784,911, Dec. 18, 1968, Pat. No. 3,773,811. This application Nov. 15, 1973, Ser. No. 416,078

Claims priority, application Israel, Dec. 26, 1967, 29228; Mar. 8, 1968, 29602

Int. Cl.[2] A01N *9/24*

U.S. Cl. 424—308 **3 Claims**

1. A method of controlling acarid populations which comprises applying an acaricidally effective amount of an ester of the formula



in which R is allyl and R′ is bromine, to plants or soil in need of such control.

4,066,786

PROCESS FOR COMBATING FUNGI

Keith Joseph Bent, Crowthorne, and John Angus William Turner, Wokingham, both of England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 441,390, Feb. 11, 1974, Pat. No. 3,984,570. This application July 8, 1976, Ser. No. 703,673

Claims priority, application United Kingdom, Feb. 22, 1973, 8753/73; July 6, 1973, 32213/73

Int. Cl.[2] A01N *9/24*

U.S. Cl. 424—313 **5 Claims**

1. A process for combating overwintering powdery mildew in trees comprising spraying said trees while in a dormant phase, with an antifungally effective amount of an aqueous composition consisting essentially of water and at least 0.5% by volume of an active ingredient which is an anionic surface active agent selected from the group consisting of sodium lauryl sulphate, sodium dodecylbenzenesulphonate, butylnaphthalene sulphonate, a mixture of the sodium salts of diisopropyl- and triisopropyl-naphthalene sulphonic acids, and sodium dioctyl sulphosuccinate.

4,066,787

STABILIZED PROSTAGLANDIN COMPOSITION AND THE PROCESS FOR THE PREPARATION THEREOF

Kiyoshi Okazaki; Hiroitsu Kawada, both of Kawagoe; Hidemi Shimizu, Ageo; Tadayoshi Ohmura, Niiza, and Jun Sekino, Kashiwa, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed May 18, 1977, Ser. No. 798,017
Claims priority, application Japan, May 21, 1976, 51-58702
Int. Cl.[2] A61K *31/19, 31/215*
U.S. Cl. 424—317 9 Claims

1. A stabilized prostaglandin composition comprising an active prostaglandin E group compound with an effective amount of calcium lactate and/or an effective amount of amylopectin.

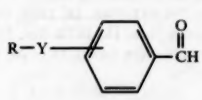
4,066,788

SUBSTITUTED BENZALDEHYDE HYPOLIPIDEMIC AGENTS

Thomas R. Blohm, Maderia; J. Martin Grisar, and Roger Alan Parker, both of Cincinnati, all of Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Oct. 3, 1975, Ser. No. 619,304
Int. Cl.[2] A61K *31/11*
U.S. Cl. 424—333 9 Claims

1. A method of reducing the lipid concentration in the blood of a patient in need thereof which comprises orally or parenterally administering to said patient a lipid-lowering effective amount of a compound of the formula:



wherein Y is oxygen or divalent sulfur; and R is a straight or branched saturated hydrocarbon chain having from 10 to 20 carbon atoms or a straight or branched unsaturated hydrocarbon chain having from 10 to 20 carbon atoms and from 1 to 4 double bonds.

4,066,789

BLENDS OF LANOLIN WAX AND ESTERS OF ALIPHATIC POLYOLS AND FATTY ACIDS

Lee R. Mores, Cincinnati, Ohio; Justin P. McCarthy, Carteret, and James J. Slack, Bound Brook, both of N.J., assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed Mar. 12, 1976, Ser. No. 666,432
Int. Cl.[2] A61K *7/00, 47/00, 7/027*
U.S. Cl. 424—365 9 Claims

1. A composition useful as a substitute for anhydrous lanolin U.S.P. consisting essentially of:

a. a hard wax fraction obtained from the fractionation of lanolin and melting in the range of 45°–60° C; and

b. an ester or partial ester of an aliphatic polyol containing from 2 to 20 carbon atoms or an ether polyol obtained by the condensation of from 2 to 8 of said aliphatic polyol units and an aliphatic monocarboxylic acid containing from about 8 to 20 carbon atoms, said ester or partial ester being a liquid at 25° C or lower; and said composition containing from about 30 to 70% by weight of component (a) and 30–70 weight percent of component (b).

4,066,790

CANNED MEAT PRODUCTS OF IMPROVED TENDERNESS

Francis G. Connick, Downers Grove, and Harry F. Bernholdt, Lombard, both of Ill., assignors to Swift & Company, Chicago, Ill.

Filed Dec. 22, 1975, Ser. No. 643,304
Int. Cl.[2] A23L *1/31*
U.S. Cl. 426—8 6 Claims

1. An improved method for producing a pasturized canned meat item of superior tenderness said method comprising: introducing into said meat item a functionally sufficient quantity of bromelin enzyme capable of complete thermal inactivation by temperatures within the range of 150°–170° F; sealing said meat item containing said enzyme into a container, said container being for delivery of the meat to consumers; and processing the sealed container through a single step of heating to pasturizing conditions that will gradually increase the meat temperature to a level within the range of 150°–185° F so as to first activate said enzyme to tenderize all portions of the meat at temperatures below 150° F and then inactivate said selected enzyme.

4,066,791

CHEESE MANUFACTURE WITH ACIDIFIED POWDERED MILK

Edgar A. Corbin, Jr., Manchester, Mo., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Aug. 4, 1976, Ser. No. 711,605
Int. Cl.[2] A23C *19/02, 9/00*
U.S. Cl. 426—39 14 Claims

1. An acid cheese curd making process comprising:

A. spraying on powdered milk an acidifying amount of a liquid food grade acid sufficient to produce an acidified powdered milk mixture which on reconstitution with water at from from 5° to about 40° C produces an acidified milk having a pH from about 4.95 to about 5.3, thereafter

B. reconstituting the acidified powdered milk mixture with water at from about 5° to about 40° C to produce an acidified milk, then

C. maintaining the acidified milk at about 26° to about 40° C, with the proviso that if the acidified milk is below 26° C, the milk is heated to about 26° to about 40° C, thereafter

D. adding to the acidified milk at about 26° to about 40° C from about 0.01 to about 0.05 parts by weight of proteolytic enzyme and, optionally, an acidogen in an amount up to about 0.5 parts by weight per 100 parts by weight of the acidified milk; and then

E. allowing the cheese, milk from step D to stand quiescent at from about 26° to about 40° C for about 45 minutes to about 2 hours so as to form an acid cheese curd suitable for making cottage chees, bakers' cheese, quark cheese, cream cheese and Neufachatel cheese.

4,066,792

METHOD OF PRODUCING SOYBEAN MILK YOGHURT

Hiroshi Kanda, Zushi, Japan; Hwa L. Wang, and Clifford W. Hesseltine, both of Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sept. 22, 1976, Ser. No. 725,224
Int. Cl.[2] A23C *9/12;* A23L *1/204*
U.S. Cl. 426—41 7 Claims

1. A process for preparing yoghurt from soybeans, comprising the steps of

a. extracting a soybean milk ultrasonically from soybeans that have been treated by soaking in water and hot aqueous sodium bicarbonate,

b. mixing the soybean milk with milk whey solids in an effective amount up to about 3% and sucrose in an amount sufficient to sweeten the soybean milk,

c. heating the soybean milk at a temperature of about 90°–121° C. for a period of 10–20 minutes,
d. mixing the hot soybean milk with a sterilized solution of a stabilizer in an amount sufficient to stabilize the soybean milk,
e. cooling said hot stabilized milk rapidly to a temperature of about 30°–35° C.,
f. inoculating said cooled milk with a mixture of *L. acidophilus* NRRL B-1910 and *L. acidophilus* NRRL B-2092 in approximately equal proportions, and
g. fermenting the so-inoculated milk to produce a yoghurt therefrom.

4,066,793

SEASONING COMPOSITION AND PREPARATION THEREOF

Hajime Eguchi, Yokohama, Japan, assignor to Ajinomoto Co., Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 557,787, March 12, 1975, abandoned. This application May 26, 1976, Ser. No. 690,365
Claims priority, application Japan, Mar. 18, 1974, 49-30764
Int. Cl.[2] A23L *1/229, 1/23, 1/28*
U.S. Cl. 426—60 **28 Claims**

1. A process for the preparation of a seasoning composition which comprises:
1. decomposing suspended yeast cells by autolysis in the presence of potassium ions at a pH of 5 to 7 at a temperature of 30° C to 60° C, and thereafter performing the following steps in any selected order:
2. adding from 5% to 20% by weight sodium chloride so that the [K+]/[Na+] ratio is more than 0.5,
3. separating clear extract from the insoluble residue,
4. heating at from 90° C to 100° C for from 10 to 30 minutes, and
5. adding from 0.5% to 4% of a 5'-nucleotide;
the percent by weight being based on the weight of the final composition.

4,066,794

INSTANT YOGURT PREPARATION

Sylvia Schur, 171 Sutton Manor, New Rochelle, N.Y. 10805

Filed June 23, 1976, Ser. No. 699,225
Int. Cl.[2] A23C *9/12, 9/10, 9/00*
U.S. Cl. 426—61 **5 Claims**

1. An instant yogurt preparation adapted when mixed with water to form a composition whose smooth texture and nutritional value is comparable to that of natural yogurt, the preparation consisting essentially of dried yogurt powder in which the culture is deactivated, a dormant dried yogurt culture, water-soluble dried milk powder, sodium alginate in an amount of about 5.20 percent by weight to act as a setting agent to form a viscous colloidal solution in which the milk and yogurt constituents are dispersed, an organic dispersing agent to promote the uniform separation of the fine particles of the solution, said organic dispersing agent being sugar in an amount about 69.26% by weight, and a sequestrant constituted by EDTA in sufficient quantity to inhibit precipitation reactions that would otherwise cause the sodium alginate setting agent to curdle and create lumps in the composition.

4,066,795

FRESH MUSHROOM TREATMENT

Bhalchandra Anantray Dave, Glendora, Calif., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 26, 1976, Ser. No. 745,269
Int. Cl.[2] A23L *1/272;* **A23B** *7/14, 7/04*
U.S. Cl. 426—259 **8 Claims**

1. A method for treating fresh mushrooms comprising first washing said mushrooms with an aqueous, free-chlorine containing solution in an amount sufficient to remove adhered soil and at a solution concentration of free-chlorine sufficient to reduce slime forming organisms thereon, then treating said mushrooms with an aqueous solution containing sulfur dioxide at a concentration sufficient to neutralize chlorine present thereon and to whiten said mushrooms, drying said mushrooms and storing the dried mushrooms without freezing at a temperature ranging from 0° to about 8° C. and a relative humidity of at least 80%.

4,066,796

COATING PIZZA PRODUCTS

Donald H. McKee, Tampa, Fla., assignor to Food Research, Inc., Tampa, Fla.

Filed Apr. 16, 1976, Ser. No. 677,836
Int. Cl.[2] A21D *15/08*
U.S. Cl. 426—302 **19 Claims**

1. A method for processing a dough product comprising the steps of:
a. preparing a pizza crust having a surface for receiving pizza food ingredients,
b. applying a gel-forming effective amount of an aqueous dispersion of water-soluble algin to cover the food ingredient receiving surface of the pizza crust,
c. applying an effective amount of an aqueous, calcium ion containing gelling solution to the algin-coated pizza crust for a period of time sufficient to form a substantially continuous edible algin-containing gelled film along this surface of the pizza crust, said film being sufficient to effectively retard the migration of material from food ingredients placed on the food ingredient receiving surface,
d. placing pizza food ingredients on the food ingredient receiving surface,
e. applying an effective amount of an aqueous dispersion of water-soluble algin over the food ingredients, and
f. applying an effective amount of an aqueous gelling solution to the algin-coated food ingredients for a period of time sufficient to form a substantially continuous edible algin-containing film over the food ingredients and any exposed portion of the algin-coated crust, said film being sufficient to retard dehydration from said pizza crust and food ingredients, said film being effective to reduce breaking and splitting of the pizza to improve the transportability thereof, said film being sufficient to constitute an oxygen barrier for retarding oxidation to prevent ingredients highly susceptible to oxidation from becoming rancid, said film being sufficient to retain flavors within the pizza during cooking, said film being sufficient to hold the food ingredients physically in place on said one surface of the pizza crust while said crust is subjected to subsequent processing steps.

12. A method of preparing a dough product comprising the steps of:
a. preparing a shaped pizza crust having a surface for receiving pizza food ingredients,
b. preparing a gel-forming aqueous dispersion of a water soluble algin having a viscosity effective to substantially uniformly coat a surface of the pizza crust,
c. applying an effective amount of the aqueous dispersion to cover the surface for receiving pizza food ingredients and
d. separately applying an effective amount of an aqueous, calcium ion containing gelling solution to the algin-coated surface for a period of time sufficient to form a substantially continuous edible algin-containing gelled film along said surface, said film being effective to reduce breaking and splitting of the pizza crust dough product to improve the transportability thereof, said film being sufficient to effectively retard the scorching of the dough product during any subsequent cooking step.

4,066,797

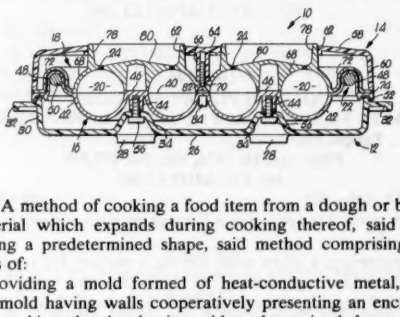
METHOD OF USING A HOME DONUT MAKER

Samuel L. McNair, Kansas City, Mo., assignor to Dazey Products Company, Industrial Airport, Kans.

Continuation of Ser. No. 745,119, Nov. 26, 1976, abandoned. This application Apr. 6, 1977, Ser. No. 785,283

Int. Cl.[2] A21B *5/08;* **A23L** *1/01*

U.S. Cl. 426—307 **5 Claims**



1. A method of cooking a food item from a dough or batter material which expands during cooking thereof, said item having a predetermined shape, said method comprising the steps of:

providing a mold formed of heat-conductive metal, said mold having walls cooperatively presenting an enclosed cooking chamber having said predetermined shape and a predetermined volume, said walls including a concave bottom wall and a top wall which is shiftable relative to bottom wall in order to allow said mold to be opened for introduction of said material thereinto, structure defining one or more apertures through said top wall, and means defining an oil-collecting cavity on said top wall in communication with said one or more apertures;

placing said mold in ambient atmosphere;

opening said mold by shifting said top wall relative to said bottom wall;

placing a quantity of said material within the region defined by the concavity of said bottom wall;

closing said mold by shifting said top wall back to a position relative to said bottom wall for presenting said enclosed chamber; and

cooking said material within said chamber to present said food item by heating at least one of said chamber-defining walls to an extent and for a period of time for cooking said material therewithin and causing said material to expand, substantially assume said predetermined shape, and form a peripheral crust,

said cooking being conducted in said ambient atmosphere and further including the steps of passing an amount of cooking oil into said chamber through said apertures during said cooking prior to complete expansion of said material, said apertures presenting the only paths provided for passage of oil into and out of said chamber, the volume of said cooking oil passed into said chamber being less than said predetermined volume of said chamber, and thereafter simultaneously further heating and cooking said material and heating said oil, with consequent expansion of said material and evolution of steam therefrom, passing at least a portion of said heated oil and said steam out said chamber through said apertures as said cooking proceeds, collecting said portion of said oil within said oil-collecting cavity as the oil is passed out of said chamber, and thereafter repassing at least a part of said collected portion of said oil back into said chamber through said apertures for absorption thereof in the crust of said item.

4. A method of cooking a food item from a dough or batter material which expands during cooking thereof, said item having a predetermined shape, said method comprising the steps of:

providing a mold formed of, heat conductive metal, said mold having walls cooperatively presenting an enclosed cooking chamber having said predetermined shape and a predetermined volume, said walls including a concave bottom wall and a top wall which is shiftable relative to said bottom wall in order to allow said mold to be opened for introduction of said batter thereinto, structure defining one or more apertures through said top wall, and means defining an oil-collecting cavity on said top wall in communication with said one or more apertures;

placing said mold in ambient atmosphere;

opening said mold by shifting said top wall relative to said bottom wall;

placing a quantity of said material within the region defined by the concavity of said bottom wall;

closing said mold by shifting said top wall back to a position relative to said bottom wall for presenting said enclosed chamber; and

cooking said material within said chamber to present said food item by heating at least one of said chamber-defining walls to an extent and for a period of time for cooking said material therewithin and causing said material to expand, substantially assume said predetermined shape, and form a peripheral crust, said cooking being conducted in said ambient atmosphere, and

placing an amount of cooking oil in said cavity, and passing said cooking oil through said apertures after said material has substantially been cooked and has substantially assumed said predetermined shape for absorption of said oil into said crust, the volume of said cooking oil passed into said chamber being less than said predetermined volume of the chamber, said apertures presenting the only paths provided for passage of oil into said chamber.

4,066,798

PROCESS FOR VACUUM PACKING AND COOLING MEAT CUTS

Michael John Follett, Fleet, England, assignor to J. Sainsbury Limited, London, England

Continuation-in-part of Ser. No. 476,609, June 5, 1974, abandoned. This application Sept. 10, 1976, Ser. No. 722,287

Claims priority, application United Kingdom, June 25, 1973, 30063/73

Int. Cl.[2] B65B *25/00*

U.S. Cl. 426—393 **10 Claims**

1. A process for packing raw red meat into domestic cuts comprising removing at least part of one of the muscles of a carcass of raw red meat within ½ to 8 hours of the animal's death and forming domestic cuts thereof, vacuum packing said cuts in air impermeable plastics bags, cooling under controlled conditions said sealed bags in a coolant having a temperature of 23° F and 60° F for a sufficient length of time for the meat to fall to a temperature within this range and for a minimum of 10 hours in water or about 24 hours in air, the rate of cooling of the muscle being sufficiently slow so that the temperature gradient within the meat is relatively quickly reduced such that a substantially consistent rate of temperature fall is achieved throughout the muscle, and storing said bags at 28.5° F to 45° F and for a period of up to 6 weeks.

4,066,799

SODIUM CHLORIDE FLAVOR SUBSTITUTE COMPOSITION AND USE THEREOF

Dennis Alfred Cornelius; Nancy Jane Eberts, both of Elkhart, and Moshe M. Sternberg, South Bend, all of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 643,016, Dec. 22, 1975, abandoned. This application Oct. 18, 1976, Ser. No. 733,156

Int. Cl.[2] A23L *1/237*

U.S. Cl. 426—534 **11 Claims**

1. A sodium chloride substitute composition having a desirable saline flavor consisting essentially of a mixture of from about 20 to about 91 weight percent of a glycinamide salt and from about 9 to about 80 weight percent of a flavor potentiator, said weight percents being based on the total weight of such composition.

4,066,800

PREPARATION OF DAIRY-BASED CHEESE FOOD

John R. Rosenau, Amherst, Mass., and John C. Anderson, St. Paul, Minn., assignors to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Nov. 30, 1973, Ser. No. 420,444
Int. Cl.[2] A23C *19/02, 19/12*
U.S. Cl. 426—582 4 Claims

1. A process for production of a dairy-based cheese food which comprises the steps of:

A. preparing a milk formulation of fat content from about 2 to 3.5%,

B. heating the milk to pasteurize the same and to denature the proteins,

C. acidifying the milk while still heated and with agitation to between about pH 4.2 and 5.1 to form curd particles,

D. while maintaining the pH, separating the curds from the resulting whey,

E. mixing a base with the curds to neutralize the same to between about pH 6.5 and 9 to solubilize the proteins,

F. mixing an acid with the neutralized curds to reacidify to about pH 5.3,

G. during mixing introducing at least one additive selected from the group consisting of coloring agents, flavoring agents, stabilizers and preservatives,

H. manipulating the curds during mixing, and

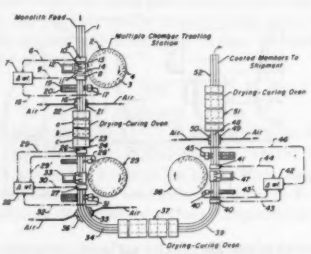
I. directly packaging the cheese food product.

4,066,801

CONTINUOUS SYSTEM FOR PROVIDING A CATALYTIC COATING ON SUPPORT MEMBERS

William A. Hoyer, Evanston; Lowell W. Johnson, and Richard J. Schoenenberger, both of Kildeer, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation of Ser. No. 516,519, Oct. 21, 1974, Pat. No. 3,959,520. This application Dec. 15, 1975, Ser. No. 641,118
The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.
Int. Cl.[2] B01J *37/02*
U.S. Cl. 427—8 7 Claims



1. A processing system which can provide for a continuous assembly-line procedure in effecting the placement of a catalytic coating on batches of particulated refractory members, which comprises the steps of:

a. placing each batch of particulated refractory members within a perforated wall containing means permitting fluid flow therethrough and around the members;

b. sequentially placing each batch of contained members into a pressure tight, confined chamber and supporting them therein to preclude blockage of fluid flow through the containing means and around the members;

c. evacuating said chamber to effect a vacuum in the pores of said refractory members;

d. subsequently filling said chamber with an aqueous treating media containing a catalytically active component to coat and fill the pores of said members;

e. draining said treating media from said confined chamber and then subsequently blowing pressurized air therethrough to remove excess media from said chamber and from the surface of said members;

f. sequentially effecting the removal of the thusly coated batches of members from said chamber;

g. sequentially passing each of the resulting batches of coated members to a drying and heat treating zone to effect the high temperature curing thereof; and

h. effecting the removal of the resulting catalytically impregnated members.

4,066,802

COLORED XEROGRAPHIC IMAGE TRANSFER PROCESS

Carl F. Clemens, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 22, 1975, Ser. No. 643,067
Int. Cl.[2] B44C *1/16;* G03G *13/16*
U.S. Cl. 427—24 16 Claims

1. A method of decalcomania comprising xerographically providing a toner image resting on an abhesive substrate, overlaying said image with an interposed sheet of polymeric plasticizing material, placing an image receiving medium in contact with said interposed sheet and applying heat and pressure to the composite formed by said image receiving medium, interposed sheet and said image bearing substrate to form a permanent image on said image receiving medium.

4,066,803

METHOD FOR APPLYING LUBRICATING MATERIALS TO METALLIC SUBSTRATES

Addison B. Scholes, Muncie, Ind.; David L. Dollar, Greeneville, Tenn., and Robert L. Hurst, Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 570,345, April 22, 1975, abandoned. This application Dec. 17, 1976, Ser. No. 751,690
Int. Cl.[2] B05D *5/08, 1/04, 1/06, 7/14*
U.S. Cl. 427—26 18 Claims

1. Method for electrostatically and uniformly dispersing particles of lubricating material upon a moving length of electrically conductive substrate, said method comprising the steps of:

providing apparatus including a housing having transverse dimensions sufficient to encompass the transverse dimensions of said substrate, having a longitudinal dimension sufficient to encompass at least a predetermined portion of said moving length of substrate and having a predetermined depth over at least one side of the intended travel path of the substrate, said housing having ingress and egress openings which permit the conductive substrate to be moved therethrough along the longitudinal axis of said housing and having a plurality of longitudinal partitions disposed within said housing on said at least one side dividing the interior of this side of the housing into a plurality of longitudinally extending sections, and including electrodes disposed within said longitudinal sections of the housing and spaced from said intended travel path of the substrate;

impressing a voltage difference between said electrodes and said substrate as it passes through said housing so as to maintain a corona discharge and charged plasma atmosphere within said longitudinal sections while a substrate is passing therethrough; and

supplying a predetermined quantity of particles of lubricating material to each longitudinal section.

4,066,804
METAL DEPOSITION PROCESS

Timothy Douglas Andrews, Manningtree, England, assignor to Imperial Chemical Industries Limited, London, England

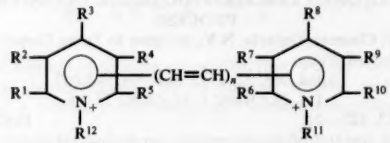
Division of Ser. No. 222,991, Feb. 2, 1972, Pat. No. 3,853,589, which is a continuation-in-part of Ser. No. 88,173, Nov. 9, 1970, abandoned. This application Oct. 1, 1974, Ser. No. 510,994

Claims priority, application United Kingdom, Nov. 26, 1969, 57862/69; May 26, 1970, 25203/70; May 20, 1971, 16006/71

Int. Cl.[2] B05D *5/12*

U.S. Cl. 427—98 **19 Claims**

1. A process for the deposition of metal in or on substrate characterized in that the substrate contains or consists of, as active component, a polymeric compound comprising units derived from a cation of the general formula



where R^{1-12} are hydrogen, halogen or organic substituents and $n = 0$ or an integer, comprising contacting the substrate with an electroless plating solution.

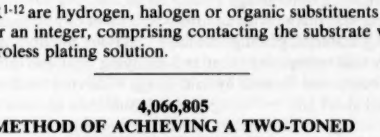
4,066,805
METHOD OF ACHIEVING A TWO-TONED FIBERBOARD PRODUCT

Jay D. Shenk, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Feb. 23, 1976, Ser. No. 659,983

Int. Cl.[2] B05D *3/02, 5/06*

U.S. Cl. 427—226 **4 Claims**



1. The method of forming a textured fiberboard product having a series of peaks or lands and intervening valleys and having a two-toned painted surface which varies from a brown to a deeper redish tone comprising:

a. forming a textured fiberboard having a series of peaks or lands and intervening valleys;

b. painting the textured surface overall with a liquid coating containing a yellow hydrated ferric oxide pigment to form an overall brown coating;

c. contacting said peaks or lands with a heated surface at a temperature and for a time sufficient to drive off the water of hydration associated with the yellow hydrated ferric oxide pigment, thus converting the yellow ferric oxide to a red ferric oxide to provide the peaks or lands with a darker reddish hue contrasting with the original brown color of the unaffected coated valleys; and thereafter

d. drying the coated fiberboard.

4,066,806
DIFFUSION COATING OF FERROUS METALS

Kenneth K. Speirs, Universal City, Tex., and Robert P. Bradley, Tilburg, Netherlands, assignors to Chromalloy American Corporation, New York, N.Y.

Filed June 22, 1976, Ser. No. 698,752

Int. Cl.[2] C23C *11/02*

U.S. Cl. 427—253 **11 Claims**

1. A pack cementation process for diffusing aluminum into a ferrous metal article while inhibiting substantial outgassing of aluminum chloride fumes during said process which comprises the steps of:

forming a dry aluminum pack containing by weight at least about 50% particulate aluminum, about ½ to ¾% $AlCl_3$ combined with about ½ to ¾% of a halide salt selected from the group consisting of an ammonium halide and an anhydrous metal chloride as an energizer, the balance particulate inert material, and maintaining said pack at a relative humidity ranging up to about 50%,

subjecting said dry pack to thermal pretreatment in a sealed retort at a temperature of about 750° to 900° F for at least about 10 hours at said temperature,

subjecting said pretreated pack to at least one more thermal pretreatment by again mixing therewith said energizer under said dry conditions and reheating said pack to a temperature in said range of about 750° to 900° F for at least about 10 hours,

thereafter again mixing with said further pretreated pack said energizer under said dry conditions the final total amount of said energizer not exceeding about 1½% by weight of said final pack,

embedding the ferrous metal article to be coated in said pack and sealing said pack and embedded article in a steel retort,

and then subjecting said pack and embedded article to a diffusion coating cycle by heating said pack to a diffusion coating temperature in the range of about 750° to 900° F and maintaining said pack at said temperature until the desired aluminum coating thickness has been obtained.

4,066,807
MARKING METAL

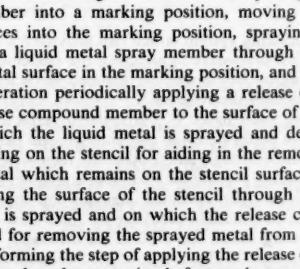
Alexander Robertson Craig, Glasgow, Scotland, assignor to Hilti Aktiengesellschaft, Schaan, Furstentum, Liechtenstein

Filed Feb. 17, 1976, Ser. No. 658,169

Claims priority, application United Kingdom, Feb. 19, 1975, 6953/75

Int. Cl.[2] B05D *1/32*

U.S. Cl. 427—282 **12 Claims**



1. A method of marking metal surfaces comprising moving a stencil member into a marking position, moving individual metal surfaces into the marking position, spraying a liquid metal from a liquid metal spray member through the stencil onto the metal surface in the marking position, and during the marking operation periodically applying a release compound from a release compound member to the surface of the stencil through which the liquid metal is sprayed and depositing a release coating on the stencil for aiding in the removal of the sprayed metal which remains on the stencil surface, periodically cleaning the surface of the stencil through which the liquid metal is sprayed and on which the release coating has been applied for removing the sprayed metal from the stencil surface, performing the step of applying the release compound for depositing the release coating before each step of spraying of the liquid metal for marking a metal surface and performing the step of cleaning the stencil surface after each spraying of the liquid metal, brushing the stencil surface with a brush member for carrying out the cleaning step, supporting the liquid metal spray member, the release compound member and

the brush member on a support member, and moving the support member relative to the stencil surface through the stencil member and transversely of the direction of movement of the stencil member.

4,066,808

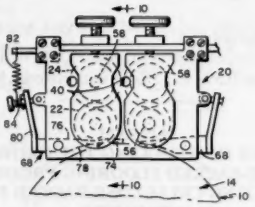
ADHESIVE APPLYING APPARATUS AND METHOD

Sidney T. Carter, Shrewsbury, Mass., assignor to A-T-O Inc., Cleveland, Ohio

Continuation of Ser. No. 337,579, March 2, 1973, abandoned. This application Aug. 18, 1975, Ser. No. 605,726

Int. Cl.[2] B05C *1/02;* **B05D** *1/28, 1/36*

U.S. Cl. 427—428 **10 Claims**



1. The method of overall coating of labels supported on a rotor for rotation about a predetermined vertical axis so that the surfaces of the labels to be coated are substantially vertical, comprising rotating the rotor so as to move the labels successively along a predetermined circular path relative to a pair of applicator rolls supported for rotation about vertical axes parallel to the axis of the rotor, the rolls of the pair of rolls being spaced along said path of movement in substantially tangential relation to said path, at the first applicator roll applying adhesive to vertically spaced parallel areas of the labels at the place of application and as the leading end of the label leaves the place of tangency of the applicator roll with the rotor stripping it away from the surface of the applicator roll so that it remains on the surface of the rotor and at the second applicator roll applying adhesive to the vertically spaced areas of the labels between the areas previously coated and stripping the leading end of the totally coated label away from the surface of the second applicator roll so that it remains on the surface of the rotor.

4,066,809

METHOD FOR PREPARING SUBSTRATE SURFACES FOR ELECTROLESS DEPOSITION

Warren Alan Alpaugh, Chenango Forks; George Joseph Macur, Endwell, and Gary Paul Vlasak, Owego, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 28, 1976, Ser. No. 700,428

Int. Cl.[2] C23C *3/02*

U.S. Cl. 427—443 **9 Claims**

1. A method for conditioning the surfaces of a dielectric base material for the electroless plating of a conductive metal thereon, comprising the steps of:

contacting the surfaces of the dielectric base material with an aqueous stannous chloride sensitizing solution comprising between 53 and 57 grams per liter of $SnCl_2 \cdot 2H_2O$ with 37% HCl at a ratio of 50 milliliters per liter;

rinsing the excess stannous chloride solution from the surfaces with hot water;

contacting the surfaces of the dielectric base material with an aqueous palladium chloride activator solution, said aqueous palladium chloride activator solution formed by mixing about 50 grams of palladium chloride having a concentration of 0.13 to 0.17 grams per liter with approximately 3780 milliliters of 37% hydrochloric acid having a concentration of 10 milliliters per liter;

contacting the surfaces of the base material with an aqueous palladium chloride/stannous chloride/hydrochloric acid seeder bath, said palladium chloride/stannous chloride/-hydrochloric acid seeder bath comprising from 1.2 to 2.5 grams per liter of $PdCl_2$, from 80 to 150 grams per liter of $SnCl_2 \cdot 2H_2O$, and from 290 to 360 milliliters per liter of 37% HCl; and,

baking the base material at a temperature of at least 105° C.

4,066,810

HEAT PRINTING SHEET AND HEAT PRINTING METHOD

Yujiro Kosaka; Masaru Uemura, both of Tokyo; Hitoshi Kuroki, Yokohama; Kanji Otomo, Machida; Yoshiaki Terauchi, Ichikawa, and Yasuo Arai, Kawasaki, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Mar. 31, 1976, Ser. No. 672,515

Claims priority, application Japan, Apr. 1, 1975, 50-39459

Int. Cl.[2] C09D *11/10;* **B32B** *3/00, 5/16, 27/06*

U.S. Cl. 428—195 **9 Claims**

1. A heat printing sheet which is prepared by the process consisting essential of

a. melting a hot melt ink at a temperature of 80°–250° C;

b. coating said hot melt ink on an engraved roll and instantaneously printing said hot melt ink on a synthetic polymer film having a thickness of 10–100μ and a smooth surface under a gauge pressure of 0.5–10 Kg/cm^2 to form a pattern of hot melt ink having a thickness of 10–300μ;

wherein said hot melt ink composition comprises:

5–60 weight parts of a base polymer of an ethylenevinyl acetate copolymer having 5–50 weight percent of the vinyl acetate content and 4–1000 g/10 min. of a melt index or a mixture of said ethylene-vinyl acetate and 5–60 weight percent of at least one member selected from the group consisting of styrene-butadiene copolymer, ethylene-acrylate copolymer, ethylene-isobutyl acrylate copolymer, cellulose derivatives, polyesters, polymethylmethacrylate; polyvinyl ethers and urethane;

20–80 weight parts of a tackifier selected from terpene resins, hydrogenated dicyclopentadiene resins, lower styrene resins, rosins, rosin polyol esters, hydrogenated rosin and rosin polyol esters and alicyclic hydrocarbon resins;

0.1–30 weight parts of a pigment or dye.

6. In hot printing a pattern of a hot melt ink composition onto a base, the improvement which comprises using a hot melt ink composition comprising:

5–60 wt parts of a base polymer of ethylene-vinyl acetate copolymer having 5–50 wt % of the vinyl acetate content and 4–1000 g/10 min of a melt index or a mixture of said ethylene-vinyl acetate substituted with 5–60 wt % of at least one member selected from the group consisting of styrene-butadiene copolymer, ethylene-acrylate copolymer, ethylene-isobutyl acrylate copolymer, cellulose derivatives, polyesters, polymethylmethacrylate, polyvinyl ethers and urethane;

20–80 wt parts of a tackifier selected from terpene resins, hydrogenated rosin and rosin polyol esters and alicyclic hydrocarbon resins;

0.1–30 wt parts of a pigment or dye,

the holt melt ink composition is melted at 80°–250° C and is coated on an engraved roll and is instantaneously printed on a base of synthetic polymer film having a thickness of 10–100μ and smooth surface under 0.5–10 kg/cm^2 (gauge) to form the pattern of the hot melt ink composition having a thickness of 10–300μ.

4,066,811
ETHYLENE-VINYL ACETATE FILM SUITABLE FOR STRETCH WRAPPING

Hirokuni Naito, Hino; Isao Yoshimura, Fujisawa; Norito Takao, Yokohama, and Yasuta Kawame, Kawasaki, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Apr. 8, 1975, Ser. No. 566,513
Claims priority, application Japan, Apr. 19, 1974, 49-43284; Apr. 19, 1974, 49-43285; May 1, 1974, 49-48280
Int. Cl.[2] C08K *5/05, 5/06, 5/10;* **C08L** *31/04*
U.S. Cl. 428—220 **14 Claims**

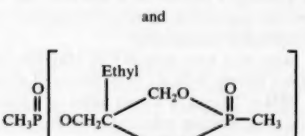
1. Films for stretch wrapping which comprise (1) 99.7–98% by weight of an ethylene-vinyl acetate copolymer having a melt index of 0.5–15 and containing 5–30% by weight of vinyl acetate and (2) 0.3–2% by weight of an additive, said additive comprising (A) 10–40% by weight of at least one polyalkylene ether polyol having a boiling point of at least 200° C. at 760 mm. Hg and a viscosity of less than 1,000 cps at 23° C. and (B) 90–60% by weight of at least one non-ionic surfactant which is an ester of a polyhydric alcohol with either a straight chain saturated fatty acid having an alkyl group of 5 to 13 carbon atoms or a straight chain unsaturated fatty acid having an alkyl group of 17 to 21 carbon atoms, said films having a kinetic coefficient of friction of 0.1–0.5, a tack strength of 0.4–1.5 kg/cm^2, a haze of less than 5%, a heat shrinkage of 30–80% and an elastic recovery of at least 60%.

4,066,812
FIRE RETARDANT POLYESTER TEXTILE MATERIALS AND METHOD OF MAKING SAME

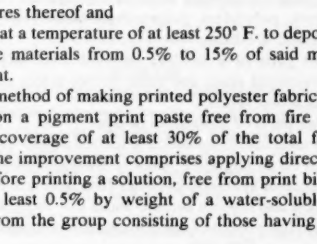
William B. Kaupin, Westwood, Mass., assignor to The William Carter Company, Needham Heights, Mass.

Continuation-in-part of Ser. No. 556,712, March 10, 1975, abandoned. This application Mar. 1, 1976, Ser. No. 662,504
Int. Cl.[2] B05D *1/36;* **D06M** *13/28, 13/32*
U.S. Cl. 428—265 **7 Claims**

1. The method of treating polyester textile materials to increase their fire resistant characteristics which comprises applying directly thereto a solution free from print binder, said solution containing at least 0.5% by weight of a water-soluble material selected from the group consisting of those having the structures



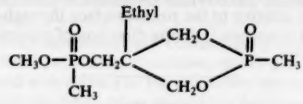
and



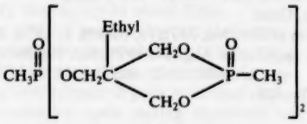
and mixtures thereof and

heating at a temperature of at least 250° F. to deposit on said textile materials from 0.5% to 15% of said material by weight.

6. The method of making printed polyester fabrics by printing thereon a pigment print paste free from fire retardants having a coverage of at least 30% of the total fabric area wherein the improvement comprises applying directly to said fabrics before printing a solution, free from print binder, containing at least 0.5% by weight of a water-soluble material selected from the group consisting of those having the structures



and



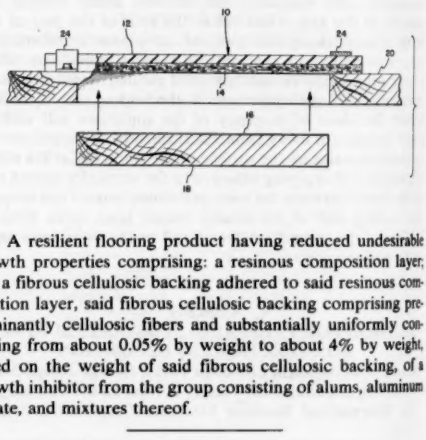
and mixtures thereof and

heating at a temperature of at least 250° F. to deposit on said fabrics from 0.5% to 15% of said material by weight.

4,066,813
METHODS OF REDUCING THE GROWTH OF CELLULOSE-BACKED FLOORING PRODUCTS AND THE RESULTING CELLULOSE-BACKED FLOORING PRODUCTS

Donald C. Winters, Whitehouse Station; Laurence F. Haemer, Fairfield, and William H. Powell, Livingston, all of N.J., assignors to Congoleum Corporation, Kearny, N.J.

Filed Feb. 4, 1977, Ser. No. 765,472
Int. Cl.[2] B32B *3/14, 3/16*
U.S. Cl. 426—282 **21 Claims**

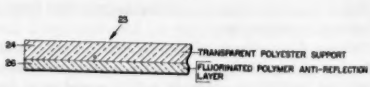


5. A resilient flooring product having reduced undesirable growth properties comprising: a resinous composition layer; and a fibrous cellulosic backing adhered to said resinous composition layer, said fibrous cellulosic backing comprising predominantly cellulosic fibers and substantially uniformly containing from about 0.05% by weight to about 4% by weight, based on the weight of said fibrous cellulosic backing, of a growth inhibitor from the group consisting of alums, aluminum sulfate, and mixtures thereof.

4,066,814
TRANSPARENT SUPPORTS FOR PHOTOGRAPHIC PRODUCTS

Charles K. Chiklis, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 354,008, April 24, 1973, Pat. No. 3,925,081. This application Dec. 8, 1975, Ser. No. 638,335
Int. Cl.[2] B32B *27/36;* **G03C** *1/78, 1/80, 3/00*
U.S. Cl. 428—333 **41 Claims**



1. A transparent element comprising a polyester film base having coated directly on at least one surface thereof an anti-reflection coating comprising a fluorinated polymer, said anti-

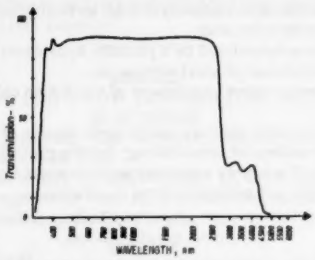
reflection coating having an index of refraction of about 1.3 to 1.45 and a quarter wave optical thickness, the index of refraction of said anti-reflection coating being at least 0.2 less than that of said polyester film base, said element including an isocyanate in said coating or between said coating and said transparent polyester support, said isocyanate being present in a quantity effective to increase the abrasion resistance of said fluorinated polymer coating.

4,066,815

GLAZING FOR TRANSMITTING SOLAR RADIATION

Jan Olink, Bois-Colombes, France, and Jacques Dela Ruye, Montigny-le-Tilleul, Belgium, assignors to BFG Glassgroup, Paris, France

Filed July 7, 1976, Ser. No. 703,221
Claims priority, application France, July 8, 1975, 75.72932
Int. Cl.² B32B *17/06*
U.S. Cl. 428—336 **18 Claims**



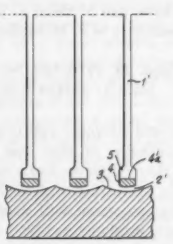
1. A glazing unit comprising, in combination: a soda-lime glass substrate having a composition such that its total energy transmittance for solar radiation is greater than that of a similarly dimensioned substrate of ordinary soda-lime glass which contains ferrous oxide, said substrate having a composition which contains iron oxide with substantially all of said iron oxide being ferric oxide, and a metal oxide coating of a composition which transmits solar radiation and at least partially reflects infrared radiation having wavelengths greater than 3μ at least partially covering at least one face of said substrate.

4,066,816

ELECTROLYTIC COLORING OF ANODIZED ALUMINIUM BY MEANS OF OPTICAL INTERFERENCE EFFECTS

Peter Geoffrey Sheasby, and Graham Cheetham, both of Banbury, England, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed July 9, 1976, Ser. No. 703,976
Claims priority, application United Kingdom, July 16, 1975, 29936/75
Int. Cl.² C25D *5/00, 5/24;* **B32B** *3/00*
U.S. Cl. 428—336 **8 Claims**



1. An aluminium article having a porous anodic oxide film on its surface, said porous anodic film having a thickness of at least 3 microns, the pores of said coating having inorganic pigmentary material deposited therein, characterized in that the average size of said deposits at their outer ends is at least 260 A and the separation between the outer ends of said deposits and the aluminium/aluminium oxide interface being in the range of 500 - 3000 A.

4,066,817

RELEASE COATING FOR ALUMINUM AND TINPLATE STEEL COOKWARE

Frank De Rossi, Zion, Ill., assignor to The Dexter Corporation, Windsor Locks, Conn.

Filed Mar. 10, 1976, Ser. No. 665,638
Int. Cl.² B32B *15/08, 15/18, 15/20*
U.S. Cl. 428—339 **8 Claims**

1. A metal cooking utensil having a food contacting surface formed of a cured, adherent film having food release properties, which comprises:

a metal cooking utensil formed of metal from the group consisting of aluminum and tinplate steel, and having a cured, adherent surface film with food release properties;

said cured film being formed of a silanol-containing organopolysiloxane resin having fine particles of a fluorocarbon polymer dispersed therein and siloxane fluid;

said silanol-containing organopolysiloxane resin being the acetone-water hydrolysis product of an organo-halosilane blend consisting essentially of about 60 mole percent of methyltrichlorosilane, about 35 mole percent of phenyltrichlorosilane, and about 5 mole percent of dimethyldichlorosilane, and having an average ratio of about 1.05 organo radicals per silicon atom;

said fluorocarbon polymer being a member selected from the group consisting of completely fluorinated and fluorochlorinated polymers of C_2–C_4 olefins, having a molecular weight of at least about 250,000, and being in the form of fine particles;

the percent by weight of organopolysiloxane resin and fluorocarbon polymer present in said cured film being about 35 to 60 percent by weight of organopolysiloxane resin and up to about 25 percent by weight of the fluorocarbon polymer.

5. A metal cooking utensil having a food contacting surface formed of a cured, adherent film having food release properties, which essentially consists of:

a metal cooking utensil formed of metal from the group consisting of aluminum and tinplate steel, and having a cured, adherent, pigmented surface film with food release properties;

said cured film being formed of a silanol-containing organopolysiloxane resin having pigment and fine particles of a fluorocarbon polymer dispersed therein and siloxane fluid;

said silanol-containing organopolysiloxane resin being the hydrolysis product of an organohalosilane blend consisting essentially of about 60 mole percent of methyltrichlorosilane, about 35 mole percent of phenyltrichlorosilane, and about 5 mole percent of dimethyldichlorosilane in the presence of water, acetone and a water-immiscible organic solvent, and having an average ratio of about 1.05 organo radicals per silicon atom;

said fluorocarbon polymer being a member selected from the group consisting of completely fluorinated and fluorochlorinated polymers of C_2–C_4 olefins, having a molecular weight in the range of from about 250,000 to about 750,000, and being in the form of fine particles;

the percent by weight of organopolysiloxane resin, fluorocarbon polymer and pigment present in said cured film being about 35 to 60 percent by weight of organopolysiloxane resin, up to about 25 percent by weight of the fluorocarbon polymer, and about 10 to 40 percent by weight of pigment.

4,066,818

LEATHER DRESSING COMPOSITION OF AN AQUEOUS EMULSION OF SOLVENT SOLUTIONS OF SUBSTITUTED CELLULOSES AND POLYURETHANES

Peter Junge, Siegburg-Seligenthal; Horst Schulz, Lohmar-Heide; Rainer Schneider, Hennef; Werner Dreke, Neunkirchen-Seelscheid, and Gerhard Rieger, Troisdord-Spich, all of Germany, assignors to KEPEC Chemische Fabrik GmbH, Siegburg, Germany

Filed Sept. 20, 1976, Ser. No. 725,003
Claims priority, application Germany, Sept. 25, 1975, 2542767
Int. Cl.[2] C08L *1/14, 1/18*
U.S. Cl. 428—341 12 Claims

1. A composition for dressing leather and leather substitutes comprising an aqueous emulsion of organic solvent solutions of (A) a substituted cellulose selected from the group consisting of nitrocellulose having a D.S. of 1.9 to 2.4, cellulose acetate butyrate having a D.S. of 2.0 to 2.8 with a ratio of acetyl to butyryl groups of 1:1 to 4:1, and mixtures thereof, and (B) a linear polyurethane resin having a molecular weight range of from 10,000 to 500,000, in a weight ratio of A:B of 1:0.1 to 1:10, where the weight ratio of organic solvents to water is from 6:1 to 1:1, said aqueous emulsion containing from 10% to 60% by weight, based on the dry weight of said substituted cellulose of a non-ionic surface-active compound as an emulsifier and said organic solvents being water-immiscible and volatile in the temperature range of 80° to 160° C.

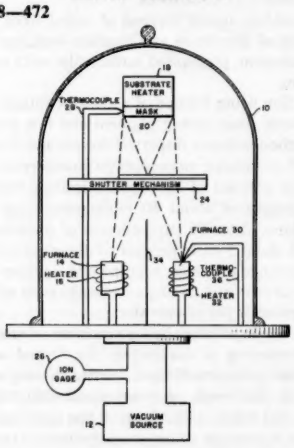
12. A leather or leather substitute dressed with from 10 gm to 35 gm dry weight per square meter of the composition for dressing leather and leather substitutes of claim 1.

4,066,819

METHOD OF BONDING GOLD FILMS TO NON-ELECTRICALLY CONDUCTING OXIDES AND PRODUCT THEREBY OBTAINED

Wallace E. Anderson, Beltsville; Albert M. Syeles, Silver Spring, and Albert D. Krall, Rockville, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 21, 1971, Ser. No. 191,292
Int. Cl.[2] B32B *15/04*
U.S. Cl. 428—472 3 Claims



1. A microstrip board comprising a gold film which contains at least one-half weight percent of aluminum, bonded to a non-electrical conducting oxide of alumina.

4,066,820

PROCESSES FOR COATING FILMS

Roger Sidney Arthur Kelly, Stevenage, and John Robert Wilson, Knebworth, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 24, 1975, Ser. No. 561,663
Claims priority, application United Kingdom, Mar. 29, 1974, 13991/74; Mar. 29, 1974, 13992/74; Mar. 29, 1974, 13993/74
Int. Cl.[2] B32B *27/08*
U.S. Cl. 428—483 10 Claims

1. A process for the production of a coated film, which comprises coating a substrate layer applied to a self-supporting synthetic linear polyester film with an aqueous, cross-linking polymeric latex or solution, wherein said substrate layer comprises: (1) a copolymer formed from ethyl acrylate, methyl methacrylate and methacrylamide, or (2) a copolyester, and the aqueous polymeric latex or solution applied thereto comprises:

A.

i. one or more polymers or copolymers of one or more of acrylic acid, methacrylic acid, an ester of acrylic acid or methacrylic acid;

ii. an unhydrolysed or a partially hydrolysed polymer or copolymer of vinyl acetate; or

iii. one or more copolymers of vinylidene chloride; and

B.

one or more resinous components capable of intra-molecular cross-linking; thereby providing a polyester film having a substrate superimposed thereon coated with said polymeric latex or solution.

4,066,821

TUNGSTEN CARBIDE TOOLS TREATED WITH GROUP IVB AND VB METALS

Nathan Henry Cook, Cambridge, Mass., and Bruce M. Kramer, Wantagh, N.Y., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 324,889, Jan. 18, 1973, abandoned. This application Jan. 22, 1976, Ser. No. 651,269
Int. Cl.[2] C23C *11/08*
U.S. Cl. 428—539 26 Claims

1. A method for forming a coating of a Group IVB or VB metal carbide on a carbide tool, said method comprising the steps of applying a Group IVB or VB metal to the surface of said tool by vapor deposition in an atmosphere which consists essentially of a halide of the Group IVB or VB metal and elemental halogen, and diffusing said metal into said tool at a temperature which is sufficient to permit formation of the Group IVB or VB metal carbide, the source of the carbon in said Group IVB or VB metal carbide being the carbon in said carbide tool.

4,066,822

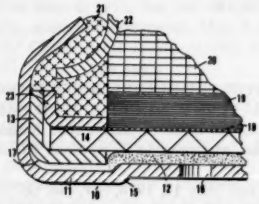
SELF SEALING MICROPOROUS MEMBRANE FOR ELECTROCHEMICAL CELLS AND METHOD OF FORMING SAME

Franciszek J. Przybyla, and Michael J. Smith, both of Mississauga, Canada, assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Sept. 28, 1976, Ser. No. 727,546
Int. Cl.[2] H01M *8/02*
U.S. Cl. 429—27 6 Claims

1. A gas-depolarized galvanic cell comprising an anode, a gas-depolarizable cathode, at least one electrolyte carrying separator disposed therebetween, and a container having a first terminal electrically associated with said anode and a second terminal electrically associated with said cathode, said terminals being electrically insulated one from the other; at least one opening in said second terminal portion of said container, a membrane of a hydrophobic microporous material interposed between said at least one opening and, said gas-depolarizable cathode, said gas-depolarizable cathode being in gas communi-

cation with said at least one opening which is positioned to permit gas to pass therethrough from the exterior environment to and through said membrane of hydrophobic microporous material; and a metal ring disposed in said container, a portion of said ring being positioned between said membrane and said



gas-depolarizable electrode and said ring being in electrical contact with said container, said ring being retained by interference fit in said container, and a portion of said membrane positioned between said ring and said container compressed to substantially zero porosity.

4,066,823

METHOD FOR A LOW TEMPERATURE OXYGEN ELECTRODE

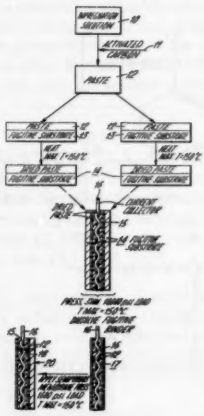
William A. Armstrong, 1265 Greyrock Crescent, Ottawa, Ontario, Canada (K2C 2A6)

Continuation of Ser. No. 505,145, Sept. 11, 1974, abandoned. This application Sept. 15, 1976, Ser. No. 723,485

Claims priority, application Canada, Sept. 11, 1973, 180804

Int. Cl.[2] H01M *4/86*

U.S. Cl. 429—41 **7 Claims**



1. An improved method for preparing a gas permeable hydrophobic electrode structure comprising: the first step of applying a paste comprising water, a wetting agent and solids consisting essentially of a water-soluble noble metal salt, a fluorocarbon polymer, and activated carbon to a fugitive substrate; the second step of heating and drying such paste at a temperature not exceeding about 150° C for a time sufficient to provide a first unit comprising a dried paste of noble metal derived from said noble metal salt, said fluorocarbon polymer and said activated carbon on said fugitive substrate; the third step of placing a metal current collecting grid between a pair of said first units in contact with the dried paste of each said first units, thereby to provide a first sub-assembly comprising a sandwich of said metal current collecting grid between a pair of said first units; the fourth step of pressing the first sub-assembly at a temperature not exceeding about 150° C; the fifth step of removing said fugitive substrate, thereby to provide a second sub-assembly; the sixth step of applying a semi-permeable membrane to one face of said second sub-assembly, thereby to provide a third sub-assembly; and the final step of pressing said third sub-assembly together at a temperature not exceeding about 100° C, thereby to provide said electrode structure.

5. A gas permeable hydrophobic electrode structure produced in accordance with the method of claim 1, in which said wetting agent is octyl phenoxypolyoxyethanol; in which said metal, current collecting grid is formed of platinum, gold, stainless steel, nickel-clad iron, nickel wire mesh, silver wires mesh, expanded nickel, or expanded silver; in which said noble metal is silver, platinum or palladium; in which said fluorocarbon polymer is polytetrafluoroethylene; in which said semi-permeable membrane is a fibrous polytetrafluoroethylene membrane or a microporous polypropylene membrane; in which said fugitive substrate is aluminum foil, and in which said fugitive substrate is removed by dissolving with KOH solution; and in which the proportions of water soluble noble metal salt, fluorocarbon polymer and activated carbon are so selected that said dried paste on said first unit has the composition:

about 2.4 to about 7.5 mg/cm^2 noble metal,
about 20 mg/cm^2 activated carbon, and
about 2.0 to about 4.0 mg/cm^2 fluorocarbon polymer.

4,066,824

CELL CONTAINING CHALCOGENIDE CATHODE, ALKALI METAL ANODE AND SOLID HALO-ALUMINUM ALKALI METAL COMPOUND ELECTROLYTE

Bhaskara M. L. Rao, Fanwood, and Bernard G. Silbernagel, Scotch Plains, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Jan. 4, 1977, Ser. No. 756,637

Int. Cl.[2] H01M *10/44*

U.S. Cl. 429—50 **13 Claims**

1. A method of operating an electric current-producing cell, comprising: drawing a current from the cell at a temperature below the melting point of the electrolyte of the cell, wherein the cell contains:

a. an alkali metal-containing anode;

b. a cathode containing as its cathode-active material, one or more chalcogenides of the empirical formula:

$$M'Z_n$$

wherein M′ is one or more metals selected from the group consisting of titanium, zirconium, hafnium, niobium, tantalum and vanadium, wherein Z is one or more chalcogens selected from the group consisting of oxygen, sulfur, selenium and tellurium, and wherein *n* is a numerical value between about 1.8 and about 3.2; and

c. a solid electrolyte consisting essentially of one or more compounds of the formula:

$$MAlX_4$$

wherein M is an alkali metal and X is one or more halogens selected from the group consisting of chlorine, bromine and iodine.

4,066,825

SYSTEM AND METHOD FOR PROTECTING THE ENVIRONMENT IN A BATTERY PRODUCTION ROOM

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 363,998, May 25, 1973, abandoned. This application Aug. 24, 1976, Ser. No. 717,362

Int. Cl.[2] H01M *2/12*

U.S. Cl. 429—71 **9 Claims**

1. A lead-acid storage battery forming room comprising:

a. a conveying surface for receiving batteries to be formed;

b. charging means for applying direct electric current to said batteries; and

c. a plurality of gas collection means, at least one for each battery to be formed, for collecting battery vapors generated during charging, each of said gas collection means

further comprising nozzle means for covering at least a portion of the fill holes of said batteries and resilient, conduit means for withdrawing said collected gases from said nozzle means, said conduit means biasing said nozzle means away from said conveying surface.

4,066,826

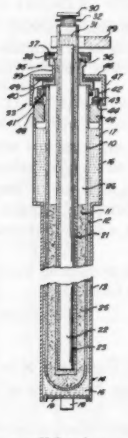
SODIUM SULPHUR CELLS

Ivor Wynn Jones; Graham Robinson, and Thomas Lewis Bird, all of Chester, England, assignors to The Electricity Council, London, England

Division of Ser. No. 550,072, Feb. 14, 1975, Pat. No. 3,982,957. This application Sept. 8, 1976, Ser. No. 721,625

Int. Cl.[2] H01M *4/36*

U.S. Cl. 429—104 **9 Claims**



1. In a sodium sulphur cell having a cathodic compartment and an anodic compartment separated by a solid electrolyte, a rigid cathode current collector in the cathodic compartment, which current collector has an external surface of carbon or graphite, the cathodic compartment containing a carbon or graphite matrix impregnated with a sulphur/polysulphide cathodic reactant extending between the current collectors and the electrolyte; the improvement in which said current collector is formed as an impermeable rod or tube containing a conductor effectively electrically connected thereto over substantially the whole length thereof and having, in its external surface, grooves or recesses into which the matrix material does not extend, said grooves or recesses thereby forming reservoirs for the cathodic reactant.

4,066,827

PROCESS FOR PRODUCING A POLYION COMPLEX HAVING A NUCLEIC ACID BASE

Toru Seita; Akihiko Shimizu, and Yujiro Kosaka, all of Shinnanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed May 17, 1976, Ser. No. 687,220

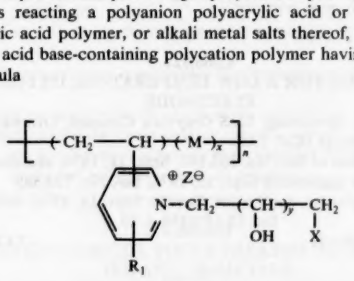
Claims priority, application Japan, May 22, 1975, 50-60241; May 22, 1975, 50-60242; May 27, 1975, 50-62533

Int. Cl.[2] C08F *8/30*; C08L *1/28*

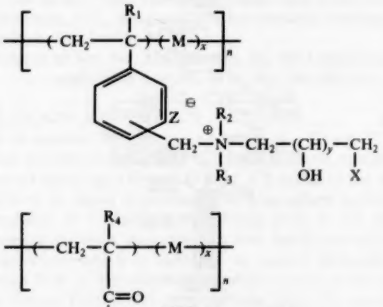
U.S. Cl. 526—50 **9 Claims**

1. A process for producing a polyion complex which comprises reacting a polyanion polyacrylic acid or polymethacrylic acid polymer, or alkali metal salts thereof, with a nucleic acid base-containing polycation polymer having the unit formula

(1)



(2)



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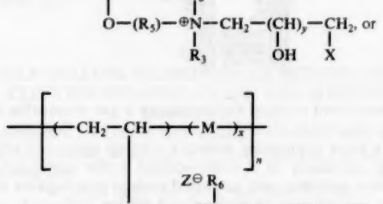

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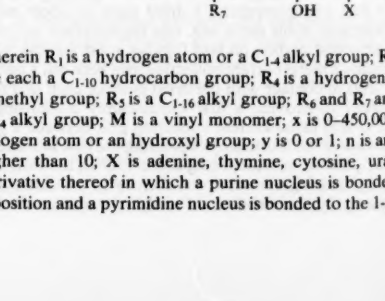


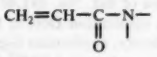
wherein R_1 is a hydrogen atom or a C_{1-4} alkyl group; R_2 and R_3 are each a C_{1-10} hydrocarbon group; R_4 is a hydrogen atom or a methyl group; R_5 is a C_{1-16} alkyl group; R_6 and R_7 are each a C_{1-4} alkyl group; M is a vinyl monomer; x is 0–450,000; Z is a halogen atom or an hydroxyl group; y is 0 or 1; n is an integer higher than 10; X is adenine, thymine, cytosine, uracil or a derivative thereof in which a purine nucleus is bonded to the 9-position and a pyrimidine nucleus is bonded to the 1-position.

4,066,828
PROCESS FOR THE PRODUCTION OF WATER-ADSORBING CELLULOSE ETHERS

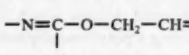
Arno Holst; Helmut Lask, and Michael Kostrzewa, all of Wiesbaden, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed May 6, 1976, Ser. No. 683,967
Claims priority, application Germany, May 7, 1975, 2520337
Int. Cl.[2] C08B *11/00, 11/20, 11/193, 15/10*
U.S. Cl. 536—87 3 Claims

1. In the process for the production of water-adsorbing, but at least partially water-insoluble, cellulose ethers in which cellulose is alkalized in a liquid reaction medium and etherified in a manner such that by etherification only an at least largely water-soluble carboxymethyl cellulose, carboxymethyl hydroxyethyl cellulose, hydroxyethyl cellulose or methyl hydroxyethyl cellulose is produced, and in which the cellulose is reacted in an alkaline reaction medium before, during or after the etherification with a cross-linking agent which is polyfunctional towards cellulose and selected from the group consisting of acrylamido methylene chloroacetamide, dichloroacetic acid, phosphorus oxychloride, or a compound in which at least two groups functional towards cellulose are

the acrylamido group 

the chlorazomethine group or

the allyloxy azomethine group 

the improvement comprising effecting alkalization, etherification, and cross-linking in a liquid reaction medium selected from the group consisting of the organic solvents, dioxane, methyl ethyl ketone, ethanol, acetone and tertiary butyl alcohol, and the solvent water.

4,066,829
MALTO-DEXTRIN POLY(H-)SULFATES

Vijay Gopalan Nair, Nanuet, N.Y.; Joseph Peter Joseph, Cliffside Park, N.J., and Seymour Bernstein, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed July 12, 1976, Ser. No. 704,583
Int. Cl.[2] C13L *1/10*
U.S. Cl. 536—103 12 Claims

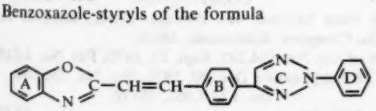
1. A Fro-Dex ® malto-dextrin poly(H-)sulfate and salt thereof prepared by sulfating a Fro-Dex ® malto-dextrin in the presence of a member selected from the group comprising alkali metal, alkaline earth metal, trialkylamine (C_1–C_6), alkanolamine (C_1–C_6), cycloalkanolamine (C_3–C_6), pyrazine and piperidine.

4,066,830
BENZOXAZOLE-STYRYLS

Geza Kormany, Allschwil, and Guglielmo Kabas, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 3, 1976, Ser. No. 663,189
Claims priority, application Switzerland, Mar. 11, 1975, 3059/75
Int. Cl.[2] C07D *413/10*
U.S. Cl. 542—456 7 Claims

1. Benzoxazole-styryls of the formula

 (1)

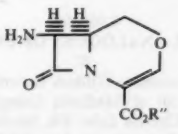
wherein the rings A, B, C and D are unsubstituted or substituted with non-chromophoric substituents, selected from the group consisting of unsubstituted alkyl with 1 to 4 carbon atoms, alkyl with 1 to 3 carbon atoms, which is substituted at the terminal carbon atom by a cyano group or COOR group, wherein R represents hydrogen, a salt-forming cation or alkyl with 1 to 5 carbon atoms, cyclohexyl, phenylakyl with 1 to 3 carbon atoms in the alkyl part, phenyl which is optionally substituted by 1 or 2 substituents from the series chlorine, methyl or methoxy; alkoxy with 1 to 4 carbon atoms, phenoxy which is optionally substituted by 1 or 2 substituents from the series chlorine, methyl or methoxy; chlorine, bromine, cyano, COOR, wherein R represents hydrogen, a salt-forming cation, alkyl with 1 to 5 carbon atoms or benzyl, CONR′ (R_1′), wherein R′ represents hydrogen, alkyl with 1 or 6 carbon atoms, alkyl with 2 to 4 carbon atoms, which is substituted at the terminal carbon atom by a dialkylamino group or an optionally quaternised dialkylamino group with 1 to 4 carbon atoms in each alkyl part, hydroxyalkyl with 1 to 4 carbon atoms, alkoxyalkyl with 2 to 8 carbon atoms, phenyl or benzyl and R_1′ represents hydrogen, alkyl with 1 to 6 carbon atoms, hydroxyalkyl with 1 to 4 carbon atoms or alkoxyalkyl with 2 to 8 carbon atoms, or R′ and R_1′, conjointly with the nitrogen, represent a morpholino or piperidino radical; SO_2OY, wherein Y denotes hydrogen, a salt-forming cation, alkyl with 1 to 5 carbon atoms, phenyl or alkyl-substituted phenyl SO_2NR' (R_1′), wherein R′ and R_1′ have the meaning indicated above, alkylsulphonyl with 1 to 6 carbon atoms, benzylsulphonyl, phenylsulphonyl or phenylsulphonyl which is substituted by chlorine or methyl, or a fused phenyl ring.

4,066,831
O-2-ISOCEPHEM-4-CARBOXYLIC ACID DERIVATIVES AS ANTIBACTERIAL AGENTS

Bernard R. Belleau, Westmount, Canada; Terrence W. Doyle, Fayetteville, N.Y.; Bing Yu Luh, and Terry T. Conway, both of Brossard, Canada, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 538,271, Jan. 2, 1975, Pat. No. 4,012,383. This application Aug. 19, 1976, Ser. No. 715,942
Int. Cl.[2] C07D *265/34*
U.S. Cl. 544—105 5 Claims

1. A compound having the formula



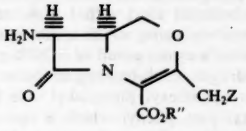
wherein R″ is hydrogen or an easily cleavable ester carboxyl-protecting group selected from the group consisting of benzhydryl, benzyl, p-nitrobenzyl, p-methoxybenzyl, trichloroethyl, trimethylsilyl, phenacyl, acetonyl, (lower)alkyl, triphenylmethyl, methoxymethyl, indanyl, phthalidyl, pivaloyloxymethyl and acetoxymethyl, or a pharmaceutically acceptable salt thereof.

4,066,832
0-2-ISOCEPHEM-4-CARBOXYLIC ACID DERIVATIVES AS ANTIBACTERIAL AGENTS

Marcel Menard; Gary M. F. Lim, both of Candiac, and Terry T. Conway, Brossard, all of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 567,323, April 11, 1975, Pat. No. 4,011,216. This application Aug. 19, 1976, Ser. No. 715,943
Int. Cl.[2] C07D *265/34*
U.S. Cl. 544—105 5 Claims

1. A compound having the formula



wherein Z is hydroxyl and R″ is hydrogen or an easily cleavable ester carboxyl-protecting group selected from the group consisting of benzhydryl, benzyl, p-nitrobenzyl, p-methoxybenzyl, trichloroethyl, trimethylsilyl, phenacyl, acetonyl, (lower)alkyl, triphenylmethyl, methoxymethyl, indanyl, phthalidyl, pivaloyloxymethyl and acetoxymethyl, or a pharmaceutically acceptable salt thereof.

4,066,833

2,3,7,8-TETRAAZASPIRO [4.4]NONANE, 2,3,7,8-TETRAAZASPIRO-[4.4]NONA-2,7-DIENE AND DERIVATIVES

Arnold T. Nielsen, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 22, 1976, Ser. No. 743,723
Int. Cl.² C07D *231/04, 231/06*
U.S. Cl. 548—356 **5 Claims**

1. 2,3,7,8-Tetraazaspiro[4.4]nonane.

5. A method for preparing 2,3,7,8-tetraazaspiro [4.4]nonane comprising the steps of:

A. preparing a solution of 4-phenylurazole in ethanolic potassium ethoxide and a solution of pentaerythrityl tetrabromide in dimethylformamide, forming a reaction mixture from the two solutions reacting it to cause 2,2′-diphenyl-1,1′3,3′-tetraoxo-6,6′-spirobi[hexahydropyrazobi 1,2-a]-s-triazole to be formed and recovering the s-triazole;

B. reacting the s-triazole from steps A. with sodium hydroxide and hydrochloric acid in succession to form 2,3,7,8-tetraazaspiro[4.4]nonane bishydrochloride and recovering the bishydrochloride;

C. reacting the bishydrochloride from step B. with potassium bisulfate to form 2,3,7,8-tetraazaspiro [4.4]nonane sulfate and recovering the sulfate; and

D. subjecting the sulfate to ammonia to form said 2,3,7,8-tetraazaspiro[4.4]nonane.

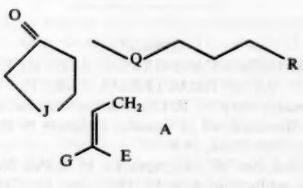
4,066,834

CYCLOALKENYL ANALOGUES OF PROSTAGLANDINS E

Warren Dexter Woessner; William Gerard Biddlecom; Henry Clifford Arndt, all of Madison; George Peter Peruzzotti, Middleton, and Charles John Sih, Madison, all of Wis., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 436,222, Jan. 24, 1974, abandoned, which is a division of Ser. No. 383,670, July 30, 1973, abandoned. This application Oct. 20, 1975, Ser. No. 624,099
Int. Cl.² C07C *177/00*
U.S. Cl. 560—121 **19 Claims**

1. A compound having the formula,



in which:

A is selected from the group consisting of methylene, ethylene, 1,1-dimethylethylene, trimethylene, tetramethylene, pentamethylene, hexamethylene, heptamethylene, and octamethylene;

E is selected from the group consisting of methylene, α-hydroxymethylene, and β-hydroxymethylene;

G is selected from the group consisting of hydrogen and methyl;

J is selected from the group consisting of methylene, α-hydroxymethylene, and β-hydroxymethylene;

Q is selected from the group consisting of ethylene and vinylene; and

R is selected from the group consisting of carboxyl, carbomethoxy, and carbethoxy.

4,066,835

PROCESS FOR PURIFYING THE WASTE WATER PRODUCED IN THE PROCESS OF PRODUCING ESTER PLASTICIZERS

Heinz-Dieter Hahn, and Jurgen Weber, both of Oberhausen, Germany, assignors to Ruhrchemie AG, Oberhausen, Germany

Continuation of Ser. No. 581,461, May 28, 1975, abandoned. This application Dec. 7, 1976, Ser. No. 748,269
Claims priority, application Germany, May 31, 1974, 2426448
Int. Cl.² C07C *69/34, 69/52*
U.S. Cl. 560—98 **11 Claims**

1. A process for the preparation of an ester plasticizer and the reduction of the chemical oxidation demand of the waste water obtained thereby which comprises

a. reacting a polybasic aliphatic or aromatic carboxylic acid with an alcohol in the presence of sulfuric acid;

b. thereafter neutralizing the raw esters with an alkaline solution thereby forming a first organic phase and a first aqueous phase;

c. separating said first aqueous phase from said first organic phase;

d. heating said first aqueous phase at a temperature of at least 200° C at the prevailing pressure thereby forming a second aqueous phase and a second organic phase which is immiscible with said second aqueous phase and which does not redissolve in said second aqueous phase upon cooling; and

e. physically separating said second organic phase from said second aqueous phase by centrifuging or decanting.

10. A process for removing an organic component from a single phase aqueous effluent obtained by the esterification of a polybasic aliphatic or aromatic carboxylic acid with an aliphatic alcohol in the presence of sulfuric acid, which water contains an alkyl hydrogen sulfate or a dialkyl sulfate, ester and unreacted reactants, which process consists essentially of:

A. Heating said effluent to a temperature above 200° C under the particular prevailing pressure thereby forming an organic phase and an aqueous phase from said effluent, which do not redissolve into each other upon cooling thereof; and

B. Thereafter mechanically removing by centrifuging or decanting said organic phase from said aqueous phase.

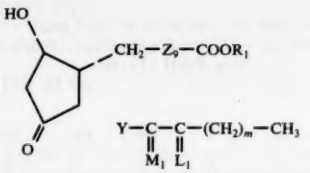
4,066,836

3,7-INTER-M-PHENYLENE-4,5,6-TRINOR-PGD$_1$ COMPOUNDS

Douglas Ross Morton, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,242, Sept. 17, 1975, Pat. No. 4,016,184. This application Dec. 30, 1976, Ser. No. 755,580
Int. Cl.² C05C *09/76*
U.S. Cl. 560—53 **33 Claims**

1. A prostaglandin analog of the formula



wherein Y is cis—CH=CH— or trans—CH=CH—;
wherein *m* is one to 5, inclusive;
wherein M_1 is

or

wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is

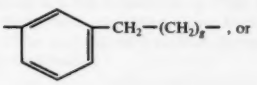
-continued

or a mixture of

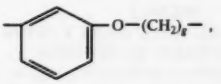
and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and
wherein Z_9 is

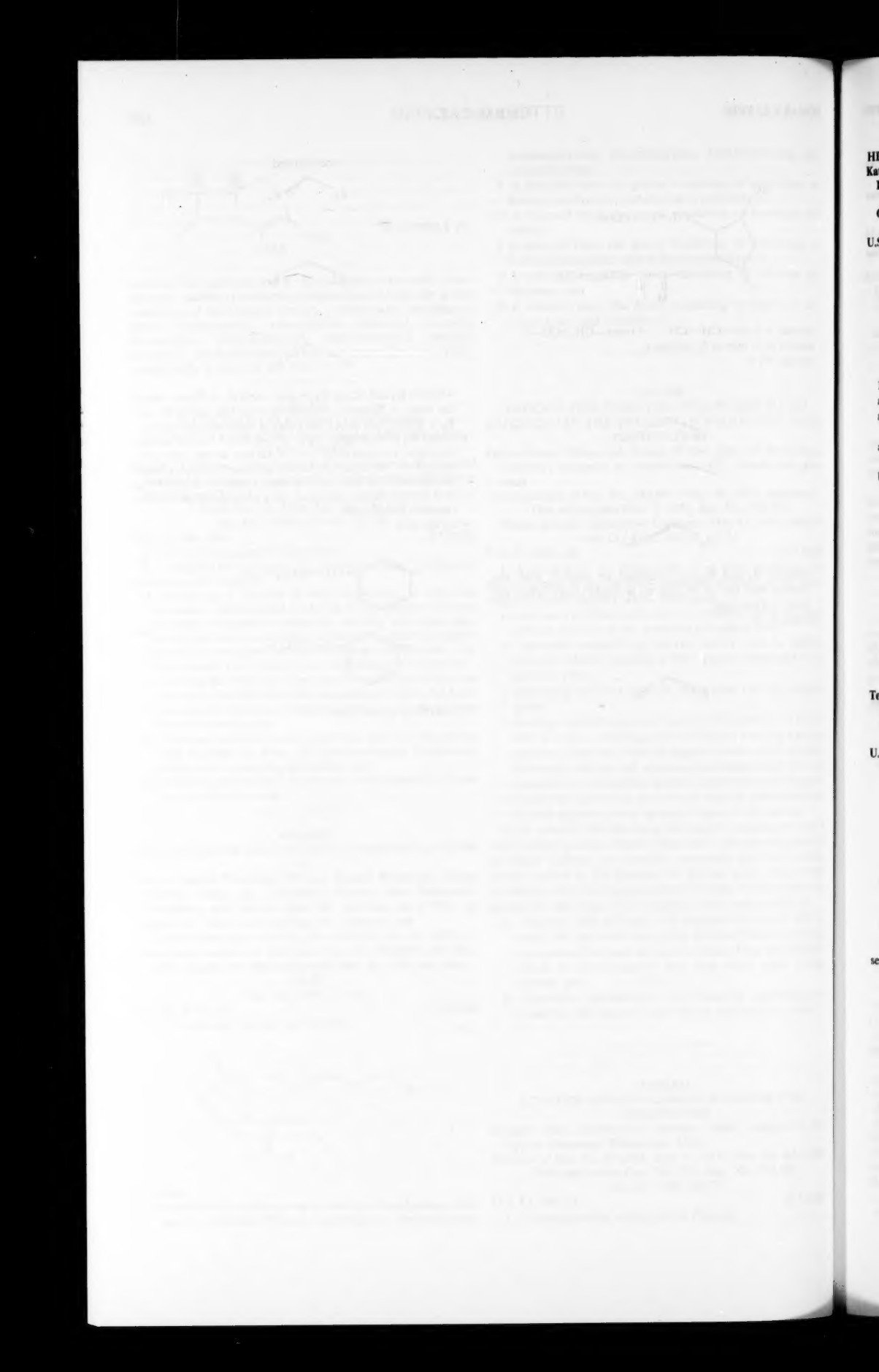
(1)



(2)



wherein *g* is one, 2, or 3.

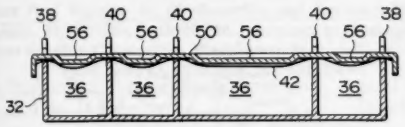


4,066,837

HIGH FREQUENCY ELECTRICAL SHIELD ASSEMBLY

Katsuhiko Miura, Soma, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed May 21, 1976, Ser. No. 688,615
Claims priority, application Japan, May 22, 1975, 50-68994
Int. Cl.[2] H05K 9/00
U.S. Cl. 174—35 GC 7 Claims



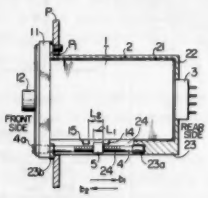
1. An electrical shield assembly comprising:
an electrically conductive box having an open side;
an electrically conductive resilient sheet engaging with and covering the open side of the box;
an electrically conductive plate formed with protuberances facing into the box; and
biasing means urging the plate into firm contact with the sheet in such a manner that the sheet is resiliently deformed by the protuberances

4,066,838

APPARATUS FOR DETACHABLY MOUNTING ELECTRICAL ASSEMBLY UNITS TO SUPPORTING PANELS

Teizo Fujita, Ibaraki, and Tosiro Ohashi, Ikeda, both of Japan, assignors to Izumi Denki Corporation, Osaka, Japan

Filed Apr. 30, 1976, Ser. No. 681,931
Int. Cl.[2] H02G 3/12
U.S. Cl. 174—48 12 Claims



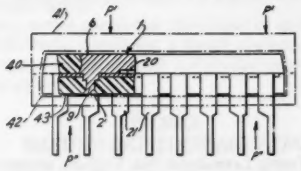
1. An apparatus for detachably mounting an electrical assembly unit to a panel, comprising:
a supporting frame adapted to be attached to said panel prior to the mounting of the electrical assembly unit;
a manipulating rod provided rotatably in said supporting frame and extending in the direction along which said unit is mounted or removed;
pressing means mounted on said manipulating rod and movable both axially of said rod and relative to said electrical assembly unit upon rotation of said rod; and
engaging means fixedly provided on said electrical assembly unit in a position to be engaged by said pressing means,
said manipulating rod being so arranged that the rotation thereof causes movement of said pressing means to bear pressingly against said engaging means whereby said electrical assembly unit is forcefully moved either to a mounted or clamped position or to a detached position in dependence upon the direction of rotation of said rod.

4,066,839

MOLDED BODY INCORPORATING HEAT DISSIPATOR

Giuseppe Cossutta, Sesto San Giovanni, and Marino Cellai, Bresso, both of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Milan, Italy

Continuation of Ser. No. 468,296, May 8, 1974, abandoned, which is a division of Ser. No. 415,748, Nov. 14, 1973, abandoned. This application Nov. 17, 1975, Ser. No. 632,589
Claims priority, application Italy, Nov. 16, 1972, 31713/72
Int. Cl.[2] H05K 5/00
U.S. Cl. 174—52 PE 8 Claims



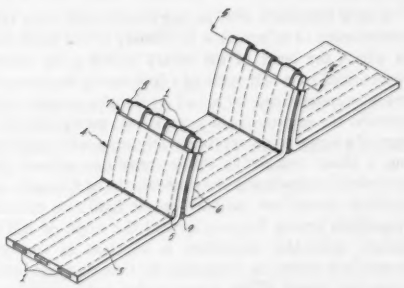
1. A modular unit comprising a generally prismatic body of plastic material and a heat-dissipating metal block imbedded in said body, said block having a large exposed surface flush with a face of said body and being rigid with at least one solid projection of constant width extending within said body and terminating in a flat broadened tip flush with an opposite face of said body, said projection rising from a side of said block remote from said exposed surface thereof for anchoring said block to said body.

4,066,840

STRIP SUPPLY LEAD WITH BRANCH LEADS AND METHOD OF MAKING SAME

Werner M. Allgaier, Westerham, Germany, assignor to Raychem GmbH, Putzbrunn, Germany

Filed June 27, 1975, Ser. No. 590,807
Claims priority, application Germany, June 28, 1974, 7422135[U]; Aug. 13, 1974, 2438878
Int. Cl.[2] H01B 7/08
U.S. Cl. 174—72 R 17 Claims



1. A method for providing strip supply lead, comprising a plurality of conductor elements embedded in an insulating material, with a branch lead comprising the steps in sequence:
A. removing a portion of the insulating material from each side of the strip supply lead in a zone intermediate the ends of the strip supply lead to completely bare a length of at least one conductor element;
B. folding the strip supply lead about the midpoint of the bared length of conductor element into a generally U-shaped configuration to bring the surfaces of portions of the intact strip supply lead immediately adjacent either end of the bared conductor element forming the extremities of the shanks of the U into an opposed relationship; and

C. bonding the opposed surfaces of intact strip supply lead to each other to form a generally U-shaped branch lead in which the bared length of conductor element provides an electrical contact.

10. A strip supply lead comprising a plurality of conductor elements embedded in an insulating material and comprising a branch lead, said branch lead comprising a generally U-shaped bend in said strip supply lead about the midpoint of a length of conductor elements bared on each side in a zone intermediate the ends of the strip supply lead, the shanks of said U having at their extremities a portion of intact strip supply lead the opposed surfaces of which are bonded to each other.

4,066,841

DATA TRANSMITTING SYSTEMS

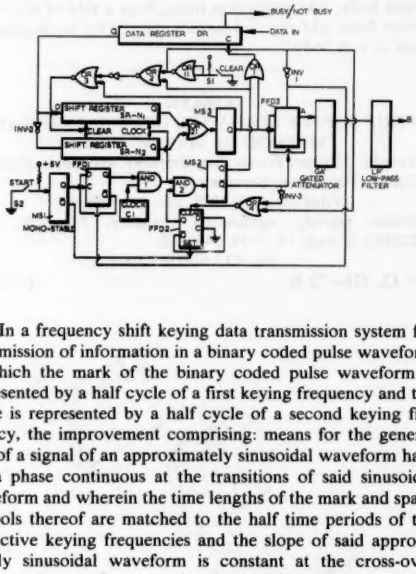
Robert Eric Young, Leamington Spa, England, assignor to Serck Industries Limited, Leamington Spa, England

Continuation of Ser. No. 544,521, Jan. 27, 1975, abandoned. This application Sept. 24, 1976, Ser. No. 726,323

Claims priority, application United Kingdom, Jan. 25, 1974, 3502/74

Int. Cl.[2] H04L *27/10*

U.S. Cl. 178—66 R **6 Claims**



1. In a frequency shift keying data transmission system for transmission of information in a binary coded pulse waveform in which the mark of the binary coded pulse waveform is represented by a half cycle of a first keying frequency and the space is represented by a half cycle of a second keying frequency, the improvement comprising: means for the generation of a signal of an approximately sinusoidal waveform having a phase continuous at the transitions of said sinusoidal waveform and wherein the time lengths of the mark and space symbols thereof are matched to the half time periods of the respective keying frequencies and the slope of said approximately sinusoidal waveform is constant at the cross-over points, and means for measuring the time duration between the crossover points of the binary coded pulse waveform signal and comparing the time duration with a reference to determine whether the duration corresponds with that of the shorter half time of the higher keying frequency or that of the longer half time period of the lower keying frequency, wherein said means for measuring and comparing includes a source of clock pulses, a counter connected to said source of clock pulses, means responsive to the beginning of a half cycle of binary coded pulse waveform signal for starting the counter, means responsive to the end of a half cycle of received signal for stopping the counter, and comparator means for determining whether the count of clock pulses during each enabled period is greater or less than a predetermined count corresponding to a time duration greater than the half time of the higher frequency and less than the half time of the lower frequency.

4,066,842

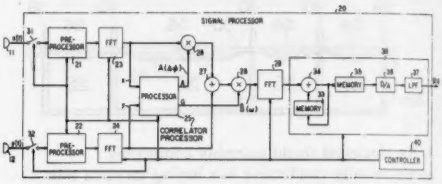
METHOD AND APPARATUS FOR CANCELLING ROOM REVERBERATION AND NOISE PICKUP

Jont Brandon Allen, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 27, 1977, Ser. No. 791,418

Int. Cl.[2] G10L *1/00*; H04R *3/00*

U.S. Cl. 179—1 P **47 Claims**



21. Apparatus for developing a nonreverberant signal including two microphones and circuitry for performing a co-phase and add operation on the output signals of said two microphones, the improvement comprising:

a processor connected to said circuitry for performing said co-phase and add operation for modifying the output signal of said circuitry in accordance with a gain control signal proportional to the averaged magnitude of the cross-spectrum function of said output signals developed by said two microphones.

4,066,843

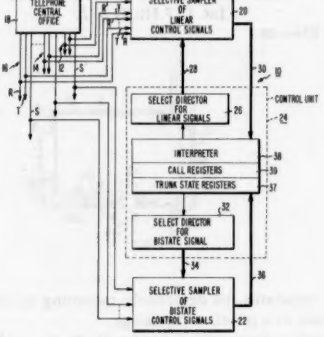
TELEPHONE CIRCUIT MONITORING SYSTEM

David J. Waks, Princeton, N.J., and Adolf Futterweit, Lahaska, Pa., assignors to Applied Data Research, Inc., Princeton, N.J.

Filed Mar. 28, 1975, Ser. No. 562,910

Int. Cl.[2] H04M *15/38*

U.S. Cl. 179—8 A **26 Claims**



1. Apparatus for monitoring signals on a plurality of telephone circuits to determine call disposition comprising:

separate input means for connection to each of said telephone circuits and for receiving call-state signals on the associated telephone circuit;

means responsive to different address signals respectively associated with said telephone circuits for detecting call-state signals on said input means associated with the addressed one of said telephone circuits, including means for detecting linear signal frequencies and the direct signal characteristics forming call-state signals appearing on said telephone circuits, and for producing corresponding signals representative of the detected signal frequencies and direct signal characteristics;

and means responsive to said representative signals for di-

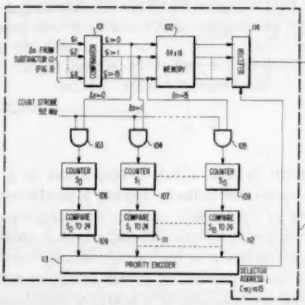
recting the generation of said address signals to control the operation of said detecting means for detecting said call-state signals.

4,066,844

ADAPTABLE ZERO ORDER PREDICTOR FOR SPEECH PREDICTIVE ENCODING COMMUNICATIONS SYSTEMS

Robert Paul Ridings, Jr., Walkersville, and Raymond Henry Lanier, Hyattsville, both of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Nov. 13, 1975, Ser. No. 631,594
Int. Cl.[2] H04J *3/16*
U.S. Cl. 179—15 BW **10 Claims**



1. In a digital communications system wherein information from a designed maximum plurality of voice circuits at a transmitting station may be transmitted to a receiving station via a transmission path of given power level, bit rate and bandwidth, apparatus for enabling the transmission of information from a number greater than said designed maximum plurality of voice circuits over said transmission path comprising:

a. means at said transmitting station for periodically sampling the amplitude of voice signals on each circuit of said plurality of voice circuits;

b. means for comparing for each said circuits, a present amplitude sample with a prior amplitude sample which has been transmitted to said receiving station, said comparing means generating difference signals in response to said comparisons;

c. means for comparing said difference signals with a plurality of aperture threshold values and generating an activity map for each aperture threshold value;

d. means for selecting the smallest aperture value which results in an activity map corresponding to activity in not exceeding a fixed predetermined number of circuits; and

e. means for generating a transmission frame comprising a digital representation of those present amplitude samples conforming to the activity map of the selected aperture value and a digital word representing said activity map.

4,066,845

PULSIVE NOISE REMOVING APPARATUS FOR AN FM RECEIVER

Hiroyasu Kishi, Gunma, Japan, assignor to Sanyo Electric Co., Ltd. and Tokyo Sanyo Electric Co. Ltd., both of Moriguchi, Japan

Filed Jan. 5, 1977, Ser. No. 756,850
Claims priority, application Japan, Mar. 19, 1976, 51-31631
Int. Cl.[2] H04H *5/00*
U.S. Cl. 179—15 BT **6 Claims**

1. An apparatus for removing noise in a composite signal including an information signal and a reference signal of a predetermined frequency, said apparatus comprising:

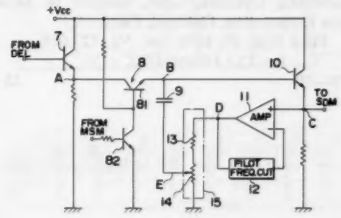
means for providing said composite signal,

means responsive to said composite signal providing means for detecting a noise signal included in said composite signal,

means responsive to said noise detecting means for providing an enabling signal of a predetermined time period upon occurence of said noise signal,

gate means responsive to said composite signal providing means and said enabling signal providing means for being opened when said enabling signal is provided from said enabling signal providing means for interrupting transmission of said composite signal and for being closed when said enabling signal is not provided from said enabling signal providing means for allowing transmission of said composite signal,

amplifying means coupled to the output of said gate means for selectively amplifying a signal component of a frequency commensurate with said predetermined frequency of said reference signal,



attenuating means coupled to the output of said amplifying means for attenuating the output from said amplifying means, and

storing means coupled to the output of said gate means and cooperative with said attenuating means for holding, when said gate means is opened, the signal level at the output of said gate means substantially to the value immediately before said gate means is opened,

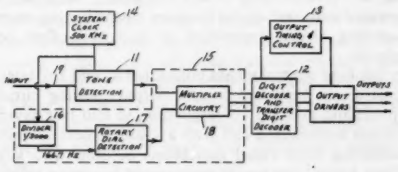
said amplifying means, said attenuating means and said storing means constituting a closed loop, said closed loop forming a positive feedback circuit with respect to said reference signal frequency which serves as an oscillator of said reference signal frequency when said gate means is opened, thereby to provide a pseudo reference signal of said predetermined frequency.

4,066,846

COMBINED ROTARY DIAL AND TOUCH-TONE TELEPHONE DECODING SYSTEM

Louis W. Champan, Kent, and Arthur T. Perkins, Bellevue, both of Wash., assignors to Melco, Bellevue, Wash.

Filed Aug. 17, 1976, Ser. No. 715,140
Int. Cl.[2] H04M *1/50*
U.S. Cl. 179—16 EC **18 Claims**



11. In a telephone dialing system, an input line adapted to receive Touch-Tone dialing signals and rotary dialing signals, Touch-Tone decoding means connected to said input line and comprising means to derive binary code words representing Touch-Tone frequencies corresponding to Touch-Tone dialed numbers, latched storage means to receive and store the binary code words, means responsive to rotary dial pulses in said

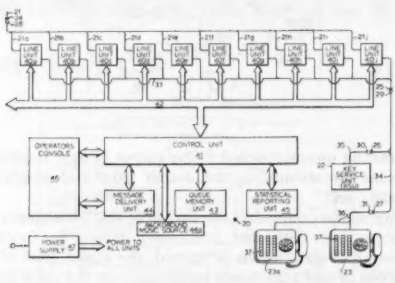
input line to generate an output code of binary signals compatible with said first-named binary code words, said output code representing a rotary dialed digit, and means to selectively connect said rotary dialed digit output code generating means and said Touch-Tone decoding means to said latched storage means in accordance with the presence or absence of rotary dial pulses in said input line, wherein said selective connecting means comprises multiplex circuit means normally connecting said Touch-Tone decoding means to said latched storage means, and means to disconnect said Touch-Tone decoding means from said latched storage means and connect said rotary dialed digit output code generating means to said latched storage means responsive to the presence of a valid rotary dialed pulse in said input line.

4,066,847

AUTOMATIC CALL ANSWERING AND SEQUENCING SYSTEM

John K. Giordano, Oakland, Calif., assignor to Automation Electronics Corporation, Oakland, Calif.

Filed Sept. 29, 1976, Ser. No. 727,684
Int. Cl.² H04M *1/72, 3/50*
U.S. Cl. 179—99 **23 Claims**



1. For use in combination with a subscriber's key telephone service unit connected to a plurality of incoming telephone lines, said unit being connected to at least one key telephone instrument provided with a plurality of indicator keys each for indicating visually the arrival of an incoming call thereon and for enabling an operator to select between said lines and to answer one of them at a time, an automatic call sequencing system comprising

scanning means connected to said lines for scanning said lines and for detecting arrival of an incoming call on each of said lines;

identifier means connected to said scanning means for identifying each line following detection of an unanswered call thereon by providing a line connection unit identifier signal;

queue memory means connected to said identifier means for storing in order of receipt all of said line connection unit identifier signals and for providing a queue-first control signal corresponding to said line having the oldest unanswered call, said queue memory means having an output queuing circuit responsive to said queue-first control signal;

key blinking control means connected to said key telephone instrument keys and to said output queuing circuit for providing said key corresponding to said line having the oldest unanswered call with a visual indication distinctly differing from visual indications of other said keys for lines having less senior unanswered incoming calls;

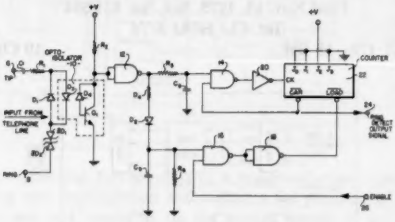
operator interrupt detection means connected to said lines and to said output queuing circuit for detecting the answering of said line having the oldest unanswered call by the operator and thereupon for advancing said queue memory means to a said line connection unit identifier signal being next in order whereupon a queue-first control signal is provided from said queue memory means through said output register queuing circuit to the said key corresponding to the next line then having the oldest unanswered call.

4,066,848

TELEPHONE RING DETECTOR CIRCUIT

James R. Darwood, Anaheim, Calif., assignor to T.A.D., Paramount, Calif.

Filed Sept. 7, 1976, Ser. No. 720,682
Int. Cl.² H04M *1/00*
U.S. Cl. 179—84 R **7 Claims**



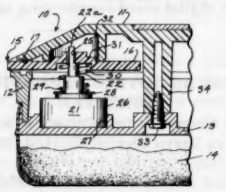
5. A detector system which is responsive to a first signal received in bursts individually having a predetermined minimum number of cycles and said bursts being separated by a first predetermined time interval, and which is unresponsive to a second signal received in bursts individually having a predetermined maximum number of cycles less than said minimum number of cycles of each burst of said first signal and separated by a second predetermined time interval, said system comprising: a counter; first circuit means connected to said counter for introducing pulses to said counter so as to cause said counter to count from a reference count; input circuit means connected to said first circuit means and responsive to the first and second signals to cause said first circuit means to introduce pulses to said counter to cause said counter to count from said reference count; reset circuit means connected to said counter to reset said counter to said reference count during the first and second predetermined time intervals; and output terminal means connected to said counter at which an output signal is produced only when said counter achieves a predetermined count corresponding to said predetermined minimum number of cycles of each of said bursts of said first signal.

4,066,849

ROTARY-TYPE CONTROL FOR HEADPHONE EARPIECE

Joseph J. Chladil, Sr., Milwaukee, Wis., assignor to Koss Corporation, Milwaukee, Wis.

Filed June 11, 1976, Ser. No. 694,973
Int. Cl.² H04R *1/10*; G05G *1/10*
U.S. Cl. 179—178 **12 Claims**



8. In an apparatus having a base containing a device having a shaft which can be rotated to control the device, shaft rotating means, and a cover for said apparatus which cover has an opening to expose a portion of the shaft rotating means so that it can be manually manipulated to control the shaft, the improvement which comprises:

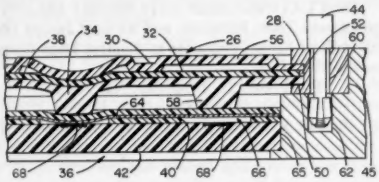
a. shaft rotating means loosely keyed to the control shaft;
b. a journal and a journal bearing associated with the shaft rotating means and the cover which cooperate to level and center the shaft rotating means in the opening in the cover; and
c. a spring which maintains the journal and journal bearing in cooperative relationship to level and center the shaft rotating means in the opening in the cover.

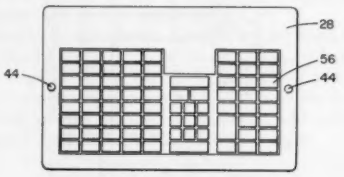
4,066,850

KEYBOARD SWITCH ASSEMBLY HAVING INTERCHANGEABLE COVER PLATE, INDICATING LAYER AND ACTUATOR SWITCH ASSEMBLY IN ANY OPERATIVE COMBINATION

George Heys, Jr., Byesville, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed June 4, 1976, Ser. No. 693,032
Int. Cl.² H01H *9/00, 13/00*
U.S. Cl. 200—5 A **8 Claims**





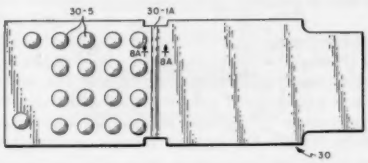
7. A manually actuable keyboard assembly comprising:
a. a switch matrix comprising a substrate having a first conductor mounted in the top surface thereof;
b. an insulating member positioned on said substrate and having openings therein;
c. a deformable membrane positioned on said insulating member and adapted for movement through said opening, said membrane having second conductors mounted adjacent the opening of said insulating member, and said substrate, insulating member and membrane being secured together in a watertight relationship;
d. a jacket assembly positioned adjacent said membrane and comprising a second substrate having projections depending therefrom in registration with respective openings in said insulating member;
e. a transparent deformable membrane having key portions formed therein, said transparent membrane and said second substrate positioned in spaced apart relationship forming a recessed area;
f. a sheet removably positioned within said recessed area and having indicia thereon aligned with said key portions;
g. and a cover member having a configuration which extends over a predetermined portion of said transparent deformable membrane to expose a predetermined number of said key portions while overlying the remaining key portions whereby only those key portions exposed by said cover member are available for operation.

4,066,851

KEYBOARD SWITCH ASSEMBLY HAVING FOLDABLE PRINTED CIRCUIT BOARD, INTEGRAL SPACER AND PREFORMED DEPRESSION-TYPE ALIGNMENT FOLD

James N. White, Carlisle, and Richard E. Seeger, Topsfield, both of Mass., assignors to Chomerics, Inc., Woburn, Mass.

Continuation-in-part of Ser. No. 627,221, Oct. 30, 1975, abandoned. This application July 1, 1976, Ser. No. 701,508
Int. Cl.² H01H *9/00, 13/02*
U.S. Cl. 200—5 A **17 Claims**



1. A keyboard component for a keyboard comprising a unitary sheet of flexible and resilient insulator plastic having first and second sections supporting contactors and contacts respectively and a tail section supporting terminals, said first section having protrusions supporting at least some of said contactors, said sections being disposed to one another in an L configuration with said first section forming one leg of said "L" and said tail section and said second section forming the other leg of said "L," said first section being foldable over said second section to align said contactors with said contacts, a contactor of an on-off switch supported by said first section, a contact of an on-off switch supported by said second section, said contactor and contact spaced substantially equidistant from the intersection of the legs of the L, a first circuit line supported by said first, second and tail sections, and extending across said intersection of the legs of the L, a second circuit line adjacent said first circuit line and supported by said second and tail sections, said first circuit line coupled to said contactor and said second circuit line coupled to said contact, and terminals supported by said tail, one terminal coupled to each circuit line and actuator means movable between on and off positions to cause said contactor to engage said contact when said actuator is in said on position.

6. A keyboard comprising a unitary sheet of flexible and resilient insulator plastic having first and second sections for supporting at least some of contactors and contacts, said sections being relatively foldable with respect to each other, said sheet haing a foldable button retaining section having a plurality of openings, and buttons retained in said openings and movable to selectively urge said contactors against said contacts.

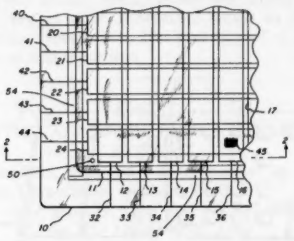
9. A keyboard component for a keyboard comprising a unitary sheet of flexible and resilient plastic having first and second sections, said first section supporting contractors and said second section supporting contacts on the same surface of the sheet and a preformed fold depression alignment means in said sheet between said first and second sections to align said contactors and contacts to one another when said sections are folded about said depression.

4,066,852

MEMBRANE-TYPE TOUCH PANEL EMPLOYING A PHOTO-RESIST INSULATING GRID ANTI-SHORT MEANS

George Edward Zenk, Richfield, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Nov. 22, 1976, Ser. No. 743,991
Int. Cl.[2] H01H *13/52, 1/50*
U.S. Cl. 200—5 A **5 Claims**



1. A transparent switch matrix to be carried on the face of a rigid insulator substrate having a predetermined radius of curvature, and comprising:

a. a plurality of spaced apart transparent conductive first strips firmly adhering to the face of the substrate;

b. a transparent resilient membrane having an undistorted contour substantially alike the pre-determined contour, and attached about its periphery to the face of the substrate in a position matching the membrane contour to the substrate contour and spaced apart from the first strips thereon in a predetermined area of the membrane;

c. a plurality of transparent, flexible, spaced apart conductive second strips firmly adhering to the resilient membrane surface facing the substrate, each of said second strips located in the area spaced apart from the first strips and thinner than the spacing therefrom, and each of said second strips crossing at least two first strips; and

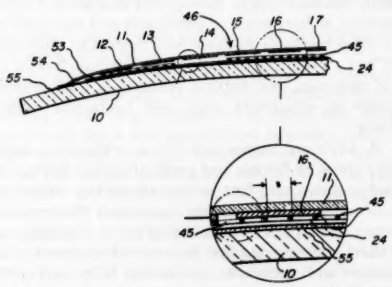
d. a thin insulating grid interposed between the first and second strips and absent external force separating the first strips from the second strips, and having within each crossover area between the first and second strips, a plurality of gaps permitting electrical contact between first and second strips responsive to manual pressure at each crossover area, said grid formed by insulating photo-resist material adherent to one of the two sets of strips.

4,066,853

MEMBRANE TYPE TOUCH PANEL EMPLOYING PIEZORESISTANT ANTI-SHORT MEANS

George Edward Zenk, Richfield, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Nov. 22, 1976, Ser. No. 744,080
Int. Cl.[2] H01H *13/50, 1/50*
U.S. Cl. 200—5 A **3 Claims**



1. A transparent switch matrix to be carried on the face of a rigid insulator substrate having a predetermined radius of curvature, and comprising:

a. a plurality of spaced apart transparent conductive first strips firmly adhering to the face of the substrate;

b. a transparent resilient membrane having an undistorted contour substantially alike the predetermined contour, and attached about its periphery to the face of the substrate in a position matching the membrane contour to the substrate contour and spaced apart from the first strips thereon in a predetermined area of the membrane;

c. a plurality of transparent, flexible, spaced apart conductive second strips firmly adhering to the resilient membrane surface facing the substrate, each of said second strips located in the area spaced apart from the first strips and thinner than the spacing therefrom, and each of said second strips crossing at least two first strips; and

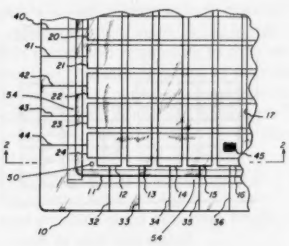
d. a piezoresistant coating interposed between the first and second strips, and permitting electrical conduction between a first and second strip responsive to manual pressure at their crossover area.

4,066,854

MEMBRANE-TYPE TOUCH PANEL EMPLOYING INSULATING GRID ANTI-SHORT MEANS

George Edward Zenk, Richfield, and Richard Joseph Ditzik, St. Paul, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Nov. 22, 1976, Ser. No. 744,207
Int. Cl.[2] H01H *13/52, 1/50*
U.S. Cl. 200—5 A **8 Claims**



1. A transparent switch matrix to be carried on the face of a rigid insulator substrate, having a predetermined radius of curvature, and comprising:

a. a plurality of spaced apart conductive first strips firmly adhering to the face of the substrate;

b. a transparent resilient insulating membrane having an undistorted contour substantially alike the predetermined contour, and attached about its periphery to the face of the substrate in a position matching the membrane contour to the substrate contour and spaced apart from the first strips thereon in a predetermined area of the membrane;

c. a plurality of transparent, flexible, spaced apart conductive second strips firmly adhering to the resilient membrane surface facing the substrate, each of said second strips located in the area spaced apart from the first strips and thinner than the spacing therefrom, and each of said second strips crossing at least two first strips; and

d. a thin insulating grip interposed between the first and second strips having within each crossover area between the first and second strips, a plurality of gaps permitting electrical contact between the first and second strips responsive to manual pressure at each crossover area.

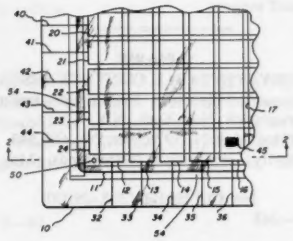
4. The switch matrix of claim **1**, wherein the insulating grid comprises a crosshatch of lines formed of a flexible insulating material adhering to the surfaces of the second strips facing the substrate and the gaps in the grid have substantially smaller dimensions than the electrical contact area between a first and second strip.

4,066,855

VENTED MEMBRANE-TYPE TOUCH PANEL

George Edward Zenk, Richfield, Minn., assignor to Control Data Corporation, Minnapolis, Minn.

Filed Nov. 22, 1976, Ser. No. 744,209
Int. Cl.[2] H01H *13/12, 1/50, 9/00*
U.S. Cl. 200—5 A 1 Claim



1. A transparent switch matrix to be carried on the face of a rigid insulator substrate having a predetermined radius of curvature, and comprising:

a. a plurality of spaced apart transparent conductive first strips firmly adhering to the face of the substrate;

b. a transparent resilient membrane having an undistorted contour substantially alike the predetermined contour, and attached about its periphery to the face of the substrate in a position matching the membrane contour to the substrate contour and spaced apart from the first strips thereon in a predetermined area of the membrane, and having a vent permitting air flow into the space between the membrane and the substrate; and

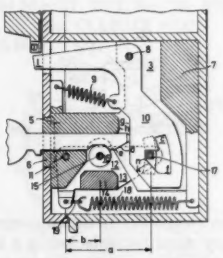
c. a plurality of transparent, flexible, spaced apart conductive second strips firmly adhering to the resilient membrane surface facing the substrate, each of said second strips located in the area spaced apart from the first strips and thinner than the spacing therefrom, and each of said second strips crossing at least two first strips.

4,066,856

LOCK FOR SAFETY CUT-OUT SWITCH

Paul Merkle, Eschenbrunnlestr. 48, 7032 Sindelfingen, Germany

Filed June 11, 1975, Ser. No. 585,750
Claims priority, application Germany, June 12, 1974, 2428454
Int. Cl.[2] H01H *9/28*
U.S. Cl. 200—44 3 Claims



1. A safety cut-out switch for electrical lines, comprising

a switch actuation knob having at its base a switch toggle disk integral therewith, said disk having a notch at its lower periphery

a switch blocking bell crank lever having a downwardly arranged leg with a cut-out therein and a horizontally arranged leg with a forward end portion pivotable between an upper and lower position, which engages said notch in the upper position to block said switch

said horizontally arranged leg being adapted to be pivoted in a vertical plane which is perpendicular to said switch toggle disk,

a lock blocking means to block said bell crank lever in an upper switch b locking position,

and an unlocking means to remove said bell crank lever from its switch b locking position,

said lock blocking means and said unlocking means being actuated by horizontal in-and outward movement of a key and adapted to cooperate with said downwardly arranged leg of said switch blocking bellcrank lever,

a first tension spring for holding said bell crank lever in its upper switch blocking position, and acting on said lever in a first direction of rotation,

said lock blocking means and said unlocking means comprising a lock blocking lever having a roller pivotably secured thereon and adapted to be pivoted in the same plane as said switch blocking lever and being loaded in a second and opposite direction of rotation, by means of a second tension spring, thereby keeping said roller in close abutment to the lower edge of an in-and outwardly movable key,

an in-and outwardly movable key provided with a notch into which said roller snaps and locks said key in its innermost position, in which the tip of said key holds said bellcrank blocking lever in its unlocking position against the tension of said first tension spring,

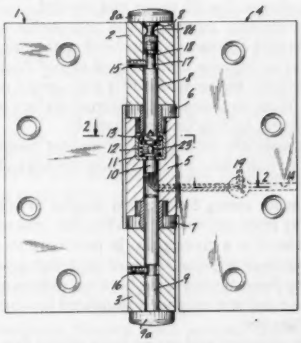
said lock blocking lever further being provided with a transverse lug, engaging said cut-out in said downwardly arranged leg, said cut-out having an oblique edge along which said lug moves during the pivoting downward motion of said lock blocking lever as said key is withdrawn, and against which said lug is abutting and thereby preventing said key from being fully withdrawn when said switch toggle disk is not in position to be blocked by said bell crank lever.

4,066,857

SWITCH ACTIVATING HINGE HAVING RECIPROCATING CAM FOLLOWER SWITCH ACTUATOR

Charles R. Suska, Roxbury, Conn., assignor to Stanley Works, New Britain, Conn.

Filed July 24, 1975, Ser. No. 598,716
Int. Cl.[2] H01H *3/16*
U.S. Cl. 200—61.7 4 Claims



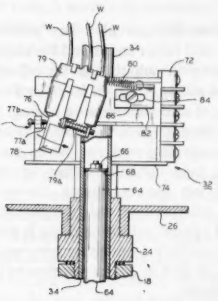
1. A switch activating hinge comprising first and second hinge leaves having axially aligned knuckles, a hinge pin fixed in the knuckle of the first leaf and extending into a knuckle of the second leaf for aligning the leaves for pivotal movement with respect to each other, a separate switch unit, including a switch actuating plunger aligned with the axis of said knuckles,

said switch unit being fixed in the knuckle of the second leaf and positioned adjacent the end of said hinge pin, a camming surface on one end of said hinge pin, follower means positioned between said camming surface and said plunger, said follower means comprising a non-circular element mounted within a corresponding non-circular case fixed in the knuckle of the second leaf and adapted for axial movement therein, said element having a cam following surface engaging said camming surface and being urged against said camming surface by a spring, whereby the relative pivotal movement between said hinge pin and said non-circular element causes axial displacement of said element, causing said element to engage said plunger and actuate said switch.

4,066,858
VERTICAL FLOAT SWITCH

Jack Richard Piper, Mount Prospect, and Leo W. Kaczmarek, Chicago, both of Ill., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,168
Int. Cl.² H01H *35/40*
U.S. Cl. 200—84 C **7 Claims**



1. A float switch suitable for use with a boiler, said switch comprising, in combination:

A housing having a first chamber therein, said housing having first and second vertically spaced-apart wall openings for communicating said first chamber with said boiler, and said housing having a secondary chamber projecting away from said first chamber and in communication therewith;

a float rod having a float fixedly mounted at its lower end thereof and having an armature of magnetic material fixedly mounted at its upper end thereof;

means for slidably mounting said rod within said housing wherein said armature is translated within said secondary chamber in response to translation of said float within said first chamber between said first and second openings;

a switch frame mounted to an external surface of said housing adjacent said secondary chamber;

a magnet assembly including a permanent magnet mounted to said switch frame for translation toward and away from said secondary chamber;

first means for spring biasing said magnet to urge said magnet away from said secondary chamber until said armature is translated to a given point in proximity to said magnet whereupon the spring force of said first means is overcome by the magnetic force between said magnet and said armature and said magnet is translated toward said secondary chamber;

means for adjusting said spring force of said first means over a range of values so that said given point can be varied over a corresponding range;

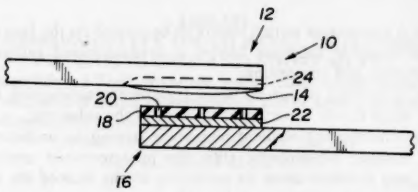
an adjustable stop mounted to said frame and engaging a portion of said magnet assembly when said magnet is translated a given distance away from said secondary chamber to selectively limit the maximum translation of said magnet to control the maximum air gap between said magnet and said armature thereby cooperating with said first means and said means for adjusting said spring force for limiting the relative values of said spring force and said magnetic force wherein the maximum value of said spring force is less than the maximum value of said magnetic force; and,

at least one switch operatively coupled to said magnet for controlling an external circuit in response to said translation of said magnet.

4,066,859
MERCURY WETTABLE CONTACT ASSEMBLY

Anthony Steinmetz, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 21, 1976, Ser. No. 688,543
Claims priority, application Netherlands, May 26, 1975, 7506140
Int. Cl.² H01H *1/08, 29/00*
U.S. Cl. 200—263 **9 Claims**

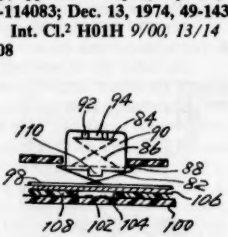


1. A switching device which comprises a moveable contact blade formed of a magnetizable metal and having a contact surface wetted with a liquid metal, and a stationary contact blade formed of a magnetisable metal and having on its contact surface a layer consisting of a non-metallic material that is not wetted by the liquid metal.

4,066,860
PUSHBUTTON SWITCH KEY ARRANGEMENT FOR KEYBOARDS HAVING INDICIA

Hiroshi Kawasaki, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sept. 25, 1975, Ser. No. 616,649
Claims priority, application Japan, Sept. 26, 1974, 49-113137; Oct. 2, 1974, 49-114083; Dec. 13, 1974, 49-143913
Int. Cl.² H01H *9/00, 13/14*
U.S. Cl. 200—308 **6 Claims**



1. A pushbutton switch key structure comprising:

a flexible unitary metal frame including a key top defining surface, a key top frame of metal strips integral with and dependent from said top surface;

an annular support shoulder integral with the lowermost end of said key top frame;

a plurality of actuating leaf spring means integrally affixed at one end to the periphery of said support shoulder and extending downwardly therefrom, and a metal base plate integrally affixed to the lower end of said spring means; and

a solid block of molded resin integrated with said key top frame in a desired push-button key configuration;

said molded resin block and said key top defining surface being configured to define operating indicia on said push-button switch key structure.

6. The invention defined in claim 1, wherein said resin overlies said key top surface, is substantially opaque and is selectively removed from said key top surface in the configuration of a desired indicia.

4,066,861

METHOD OF WELDING A PIPE TO A PIPE PLATE

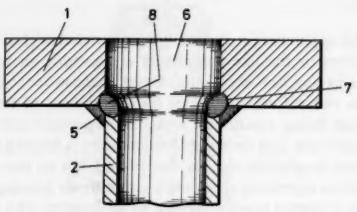
Johannus Jacobus Broodman, Breskens, Netherlands, assignor to B.V. Koninklijke Maatschappij "De Schelde", Netherlands

Filed Jan. 19, 1976, Ser. No. 650,187

Claims priority, application Netherlands, Jan. 23, 1975, 7500814

Int. Cl.² B23K *31/00*

U.S. Cl. 219—61 **7 Claims**



1. Method of welding a pipe to a pipe plate comprising the steps of:

inserting one of the pipe ends over a short distance in a bore in the pipe plate, the bore being in alignment with the pipe;

sliding a ring over said pipe to such a point that it abuts against the pipe plate wall adjacent said bore;

internal bore welding said pipe end to said plate by means of a non-consumable electrode positioned within said bore, and supplying so much welding heat that a portion only of the ring melts whereby the non-molten material of the ring serves as a support for the molten material.

4,066,862

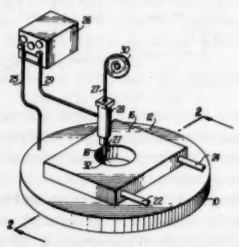
METHOD OF BUILDING-UP A LAYER OF METAL ON A METAL SURFACE

Eugene R. Tippmann, 10120 Islepine Drive, Fort Wayne, Ind. 46815

Filed May 27, 1977, Ser. No. 801,238

Int. Cl.² B23K *9/00*

U.S. Cl. 219—76.14 **1 Claim**



1. A method of building up a layer of metal on a metal object comprising the steps of:

a. positioning a mold on said metal object in the area said layer of metal is to be deposited, said mold having a wall defining a cavity of the desired configuration of said metal layer,

b. feeding a consumable filler wire having a core containing flux into said cavity of said mold in a predetermined manner while providing an electric arc between said wire and said metal object to melt said wire and transfer said flux to said walls of said cavity,

c. cooling said mold to rapidly solidify said flux transferred thereto to thereby form a smooth, ceramic-like shield between said walls and said molten metal, and

d. removing said mold when said molten metal solidifies.

4,066,863

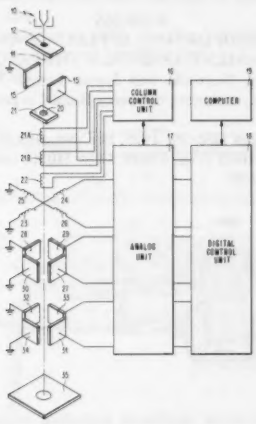
METHOD AND SYSTEM FOR AUTOMATICALLY CORRECTING ABERRATIONS OF A BEAM OF CHARGED PARTICLES

Samuel K. Doran, Wappingers Falls, and Merlyn H. Perkins, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 26, 1974, Ser. No. 483,267

Int. Cl.² B23K *15/00*

U.S. Cl. 219—121 EM **57 Claims**



31. A method for automatically correcting the aberration of a beam of charged particles as the beam is moved from the center of a deflection field including:

moving the beam to any position within the field;

electronically dividing the field into a plurality of sectors by lines passing through the center of the field;

electronically determining any of the locations of the beam within the field to which the beam is moved by electronically determining in which sector the beam is located;

and correcting the aberration of the beam in accordance with the location of the beam in the field relative to the center of the field so that the beam has no aberration at its location in the field.

4,066,864

METHOD AND APPARATUS FOR PRODUCING FEEDERS FOR SUPPLY OF HEAT SOFTENABLE MATERIALS

Arthur C. Heitmann, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

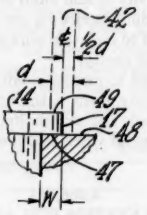
Continuation-in-part of Ser. No. 377,854, July 9, 1973, abandoned. This application May 29, 1975, Ser. No. 582,058

Int. Cl.² B23K *9/00*

U.S. Cl. 219—121 EM **12 Claims**

1. In a method of forming a stream feeder wherein a tubular member having a flange and a shank is welded to a plate, the improvement comprising:

directing an electron beam along the peripheral edge of the flange to simultaneously contact the flange and the plate



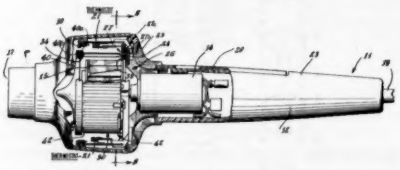
and to weld the flange to the plate in the absence of fusing the shank to the plate.

4,066,865

PORTABLE HAIR DRYING APPLIANCE AND HEATING ELEMENT ASSEMBLY THEREFOR

Siegfried Godel, Norwalk, and James Joseph Viola, Orange, both of Conn., assignors to Sperry Rand Corporation, Bridgeport, Conn.

Filed Dec. 29, 1975, Ser. No. 645,314
Int. Cl.[2] H05B *3/02;* **F24H** *3/04;* **H01C** *1/082, 3/10*
U.S. Cl. 219—370 **11 Claims**



8. In an electrical appliance including in combination, a casing having air intake vents and an air discharge orifice spaced from said intake vents, a mounting member located within said casing between said intake vents and said discharge orifice, airflow generating means mounted in axial alignment with said mounting member, a cylindrical-shaped heater assembly mounted in axial alignment with said airflow operating means and comprising a pair of spaced disc members having a central opening therein to permit airflow therethrough, a cylindrical-shaped heater element extending between said disc members and formed of a flexible electrical resistance foil strip having a plurality of transverse ribs interconnected at their end portions to form a continuous resistance element, said ribs each having an air directing vane formed therein between said end portions, said end portions mounted on the periphery of said disc members, said airflow generating means being operable for generating an airstream in said casing from said intake vents through said heater assembly to said exhaust orifice and outwardly of said casing, the improvement comprising,

a. a plurality of spaced teeth formed around the periphery of each of said disc members,

b. said end portions of said heater element being mounted in engagement with said teeth, and

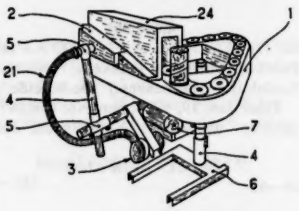
c. means cooperating with and contacting said teeth around the periphery of at least one of said disc members for containing said end portions lying between the teeth of said at least one disc member to prevent dislodgment of said end portions from said at least on disc member.

4,066,866

APPARATUS FOR SHRINKING SLEEVES AROUND CONTAINERS

Jacques Fresnel, Paris, France, assignor to SLEEVER Societe de droit francais (S.a.r.l.), Morangis, France

Filed Oct. 8, 1976, Ser. No. 731,090
Claims priority, application France, Oct. 9, 1975, 75.30896
Int. Cl.[2] F27B *9/06;* **F27D** *11/02*
U.S. Cl. 219—388 **13 Claims**



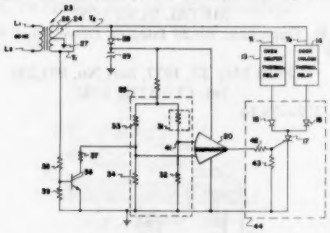
1. An apparatus for shrinking heat-shrinkable sleeves around containers or the like comprising a conveyor on which containers having heat-shrinkage sleeves thereon are to be moved; at least two diffuser housings, respective ones of said diffuser housings being positioned adjacent respective side edges of said conveyor and defining therebetween a heating station; at least one lengthwise slot for distributing hot air into said heating station extending along each said diffuser housing, said slot having a central portion having an inclination with respect to vertical and presenting vertical directional discontinuity along its two opposite end portions, said end portions having respective inclinations with respect to vertical different from the inclination of said central portion; and means for feeding hot air to said diffuser housings.

4,066,867

TEMPERATURE CONTROL CIRCUIT WITH TWO INDEPENDENT SWITCH OUTPUTS

Jon H. Bechtel, Wayne, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 19, 1976, Ser. No. 733,973
Int. Cl.[2] H05B *1/02*
U.S. Cl. 219—483 **16 Claims**



1. An electrical temperature control circuit energized from an alternating current voltage supply comprising:

means for sensing temperature and generating a temperature signal representative thereof;

means including and for time sharing said temperature sensing means by alternately generating separate setpoint temperature signals representative of two preselected setpoint temperatures during alternate and opposite phases of said alternating current supply voltage;

comparator means for alternately comparing said temperature signal with each of said setpoint temperature signals during alternate and opposite phases of said alternating

current supply voltage and generating an output control signal based on said comparison;

two control means; and

switching means responsive to said output control signal of said comparator means for alternately and selectively energizing said control means from said alternating current voltage supply.

4,066,868

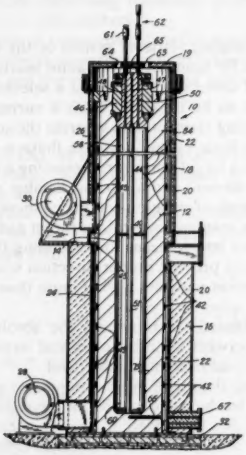
TEMPERATURE CONTROL METHOD AND APPARATUS

Donald E. Witkin, and Arnold G. Bowles, both of Warren, Pa., assignors to National Forge Company, Irvine, Pa.

Division of Ser. No. 536,372, Dec. 26, 1974, Pat. No. 3,922,527. This application July 7, 1975, Ser. No. 593,709

Int. Cl.[2] H05B 1/02

U.S. Cl. 219—486 **7 Claims**



1. A method for controlling the temperature difference between two locations is an interactive system comprising the steps of

sensing a first temperature at the first location,

sensing a second temperature at the second location,

applying fist and second output energy in response to the difference between the first and second sensed temperatures to first and second heater elements associated with the first and second locations respectively; and

maintaining the total energy applied to said first and second heater elements substantially constant.

4,066,869

COMPRESSOR LUBRICATING OIL HEATER CONTROL

Thomas L. Apaloo, Carson; Wayne H. Garside, Arcadia, and Isaac Berger, Hacienda Heights, all of Calif., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 6, 1974, Ser. No. 530,250

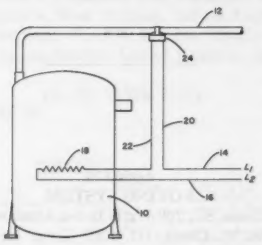
Int. Cl.[2] H05B 1/02

U.S. Cl. 219—490 **5 Claims**

1. A control for selectively energizing a heater provided to raise the temperature of lubricating oil of a compressor employed in a refrigeration unit comprising:

means to provide electrical energy to said heater; and

thermostatically operated switch means associated with said heater for selectively connecting said heater to said source of electrical energy, said switch means being responsive to the temperature of the ambient to connect said heater to said source of electrical energy when the sensed temperature is below a predetermined level and the compressor is deenergized, with said switch means disconnecting said heater from said source of electrical energy when the sensed ambient temperature exceeds said predetermined



level or when said compressor is energized regardless of the ambient temperature.

4,066,870

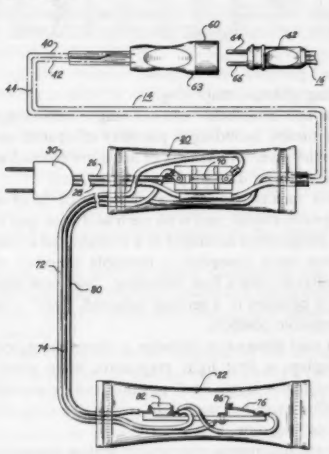
FLEXIBLE ELECTRIC HEATING CABLE

Jerrold L. Colten, Lakeville, Ind., assignor to Bristol Products, Inc., Bristol, Ind.

Filed Dec. 6, 1976, Ser. No. 747,815

Int. Cl.[2] H05B 3/36

U.S. Cl. 219—528 **10 Claims**



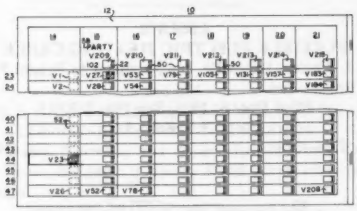
1. A flexible electric heating cable comprising a cold lead section having two cold wires, electrical means for connecting said cold wires to a source of electrical power, a heating section having a resistance heating wire and electrical insulation surrounding said heating wire, a thermostatic element connected to one of said cold wires, electrical means connecting the other of said cold wires to one end of said resistance wire, a light and manually operated, normally closed switch remotely located from said cold and heating sections, enclosure means containing said light and said enclosure means being at least partially flexible and partially translucent for operating said switch and observing said light switch, a first lead connecting at one end to said one cold lead between the source of power and said thermostatic element and at the other end to said light, a second lead connected to the other end of said resistance wire and to said light to complete a circuit through said light, a third lead connected to the side of said thermostatic element opposite said first lead and to said switch, and a means connecting said switch to said second lead, whereby said light glows when either said switch or thermostat is open

while the cable is connected to a source of power if neither the cold nor heating sections is defective.

4,066,871
VOTING SYSTEM

Charles M. Cason, Sr., 700 Watts Drive, Huntsville, Ala. 35801, and Charles M. Cason, III, 1207 Toney Drive, Huntsville, Ala. 35802

Filed Nov. 18, 1976, Ser. No. 742,873
Int. Cl.[2] G07C *13/00*
U.S. Cl. 235—54 F 4 Claims



1. A voting system comprising:

a portable and hand-held vote entering means comprising:

display means including a plurality of spaced rows and columns wherein a matrix of areas are formed in which discrete ballot data may be inserted, and

selection means including a plurality of hand-operated designators associated with each said area, and wherein:

said designators arranged in a plurality of columns and rows each comprise a movable member which is shiftable from a first, reference, "no" vote representative position to a second, selected, "yes" vote representative position,

each said designator includes a viewable region which displays a first light responsive state when a said designator is in a "no" position and a contrasting and different and second light responsive state when in a "yes" position, and

vote reading means comprising optical means for viewing said viewable region of each said designator and providing a discrete output when a discrete vote designator is in a said "yes" position;

vote processing means, separate from said vote entering means, including receptacle means adapted to receive a said vote entering means including vote accumulating means responsive to a said vote entering means and to said output signals from said vote reading means for registering and providing discrete totals of votes cast by discrete said designators from a plurality of instances of engagement of said vote entering means with said receptacle means;

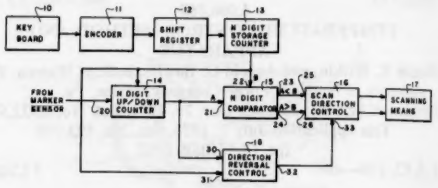
impermissible vote detection means coupled between said vote reading means and said vote accumulating means, and responsive to the state of said designators after an instance of use by a voter for signalling an error in the event that more than a selected number of said designators of a selected group of designators is moved to a "yes" position; and

reset means housed by said vote processing means for resetting all said designators to a "no" state.

4,066,872
INFORMATION RETRIEVAL SYSTEM WITH EXPANDED LOGIC CAPABILITY

Robert S. Karp, Evanston, and John R. Flint, Barrington, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Aug. 3, 1976, Ser. No. 711,175
Int. Cl.[2] G03B *23/12;* G11B *15/18*
U.S. Cl. 353—26 A 8 Claims



1. In an information retrieval system of the type having a scanning system for scanning information bearing elements in first and second directions to arrive at a selected information bearing element to be inspected from a currently inspected information bearing element, and wherein the scanning means is controlled by logic means having a finite *n* digit capacity which acts upon a target number representing a selected information bearing element and a current number representing a currently inspected information bearing element for providing normal direction scanning control for target and current numbers of *n* digits or less, a means for expanding the capacity of the logic means to provide proper direction scanning control for target or current numbers having more than *n* digits comprising:

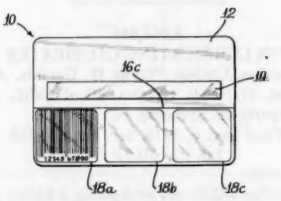
difference means for determining the absolute numerical difference between the *n*th digit of said target number and *n*th digit of said current number; and

direction reversal control means coupled to said difference means and to the logic means for reversing the normal scanning means information bearing element scanning direction when said absolute numerical difference is equal to or greater than a preselected integer.

4,066,873
IDENTIFICATION AND ACCESS CARD WITH ASSOCIATED OPTICAL DECODING MEANS

Vernon L. Schatz, Northfield, Ill., assignor to The First National Bank of Chicago, Chicago, Ill.

Filed Jan. 26, 1976, Ser. No. 652,089
Int. Cl.[2] G06K *7/14;* G09F *3/02*
U.S. Cl. 235—487 14 Claims



1. An identification and access card for use with an automatic optical scanning apparatus receiving products omnidirectionally bearing product identification codes thereon, comprising, in combination:

a plastic card blank having indicia thereon identifying a banking institution, said card blank being adapted to be embossed to provide raised indicia identifying the card holder to whom the card is issued;

at least two lables on said card spaced from each other to

provide separate information labels, each of said labels being secured to said card blank and having a generally quadrilateral area substantially less than that of said card blank, each of said labels having a plurality of elongated dark bars separated by light bars therebetween, the thickness and spacing of said bars providing binary coded information identifying a routing number, transit number, branch number of said banking institution and an account number of the card holder;

at least one of said bars on each of said labels scannable for identifying the label as bearing identification and access numbers rather than product numbers;

said labels being located on said card blank so that different ones of said labels may be read first causing said labels to be read out of sequential order for these labels,

at least one of said bars on each of said labels scannable for identifying its sequential order relative to another label on said card for combining therewith to define the proper sequence for said numbers;

a thin coating of transparent material overlying said labels and providing a smooth transition between the surface of the blank and the surface over said labels.

4,066,874

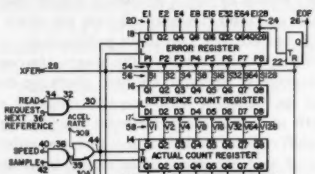
DIGITAL SPEED CONTROL SYSTEM

Mark Layne Shaw, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed July 8, 1976, Ser. No. 703,479

Int. Cl.[2] G06M *3/08*; F22B *11/00*

U.S. Cl. 235—92 CM **5 Claims**



1. A digital system for use in a system for controlling vehicular speed and acceleration, said digital system comprising:

counting signal means for generating a first counting signal representative of a first velocity, a second counting signal representative of a predetermined acceleration, and a third counting signal representative of a second velocity;

first counting means responsive to said first, second, and third counting signals and coupled to said counting signal means for counting from an initial value to a first binary number representative of said first velocity in response to said first counting signal, counting from said first binary number to a second binary number in response to said second counting signal, and counting from an initial value to a third binary number representative of said second velocity in response to said third counting signal;

second counting means coupled to said counting signal means and to said first counting means for storing the logical complement of said second binary number and counting from said complement to a fourth binary number in response to said third counting signal;

first means coupled to said first counting means and said second counting means for generating said complement, and entering said complement into said second counting means;

decoding means coupled to said second counting means for decoding said fourth binary number to produce a binary number representing the algebraic difference between said second binary number and said third binary number.

4,066,875

HIGH SPEED PULSE COUNTER

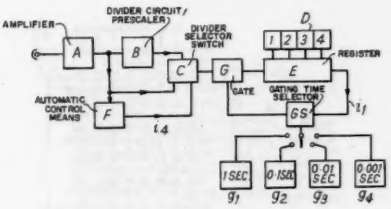
David R. Ollington, 9 Woodland Way, Caterham, and Ishver L. Zala, 129 Fleetside, West Molesey, both of England

Filed Sept. 17, 1976, Ser. No. 724,374

Claims priority, application United Kingdom, Sept. 7, 1976, 37082/76

Int. Cl.[2] H03K *21/34*

U.S. Cl. 235—92 TF **3 Claims**



1. A high speed pulse counter comprising an input for a pulse signal to be counted,

a counter register,

a counter display responsive to the pulse count of the register,

a gate for gating the input signal to be counted, the gate being arranged between the input and the register,

a plurality of different gating time generators arranged to be coupled in sequence each having a discrete gating time,

a gating time selector adapted for stepping between and coupling a selected one of the gating time generators to the gate,

the register generating an overflow pulse in response to receipt of that one of the input pulses of the input signal to be counted succeeding the input pulse which causes the counter display to indicate a full register within the time period of a currently operative gating time itself determined by the operative position of the gating time selector,

the gating time selector being coupled to the register to receive any such overflow pulse and being operative to be stepped thereby to the next gating time generator in said sequence,

at least one divider circuit adapted to sub-divide the input signal to be counted and arrange for only a predetermined ratio of said input pulses to be counted by the register,

and means for automatically actuating the divider circuit comprising an input for the pulse signal to be counted to automatic control means operative to control a divider circuit selector switch according to whether said pulse signal exceeds a predetermined frequency.

4,066,876

DIGITAL SPEED CONTROL SYSTEM

Mark Layne Shaw, Austin, Tex., and Howard Fredrick Weber, Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed July 8, 1976, Ser. No. 703,484

Int. Cl.[2] G06M *3/02, 3/08*; B60K *31/00*

U.S. Cl. 235—92 CM **8 Claims**

1. A logic circuit for producing a digital number equal to the algebraic difference between a second binary number and a third binary number, said logic circuit comprising:

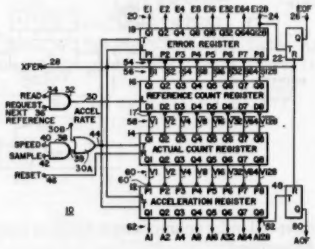
first counting means for temporarily storing a first binary number and counting up to said second binary number from said first binary number in response to a counting signal;

second counting means coupled to said first counting means for temporarily storing the complement of said second binary number and counting up to said third binary number from said complement in response to said counting

signal, said second counting means including an overflow bit location;

first means coupling said first counting means to said second counting means for entering said complement into said second counting means; and

second means coupled to said second counting means for decoding said third binary number to produce a fourth binary number equal to the algebraic difference between said second binary number and said third binary number,



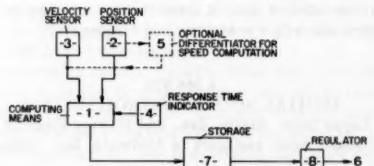
said fourth binary number consisting of all logical "zeros" if said overflow bit location contains a logical zero and said third binary number consists of all logical "ones", said fourth binary number being equal to said third binary number plus one if said overflow bit location contains a logical "one", and said fourth binary number being equal to the complement of said third binary number if said overflow bit location contains a logical "zero" and said third binary number does not consist of all logical "ones".

4,066,877

PROCEDURE AND SYSTEM FOR DRIVING A VEHICLE

Alain D. Virnot, and Simon A. Cynober, both of Paris, France, assignors to Jeumont-Schneider, Puteaux, France

Filed Apr. 20, 1976, Ser. No. 678,649
Claims priority, application France, Apr. 29, 1975, 75.13327
Int. Cl.[2] G06F *15/50;* **B60K** *31/00*
U.S. Cl. 364—426 **23 Claims**



1. A driverless method for operating a vehicle along a path comprising the steps of:

a. storing information pertaining to operation of several elements of the vehicle in relation to the vehicle's position on the path;

b. sensing data related to the vehicle's position along the path,

c. automatically operating one of said elements responsive to the sensed data and to the stored information, and

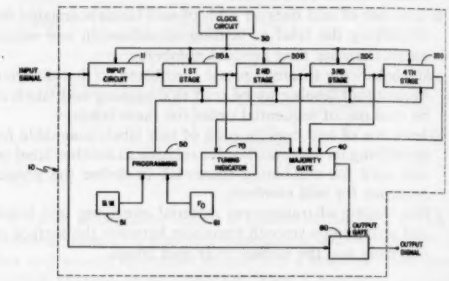
d. correcting said operating step in accordance with vehicle speed and response time of said elements.

4,066,878

TIME-DOMAIN FILTER FOR RECURSIVE TYPE SIGNALS

Raymond M. Miller, Fredericksburg, and John J. Teti, King George, both of Va.

Filed Mar. 29, 1976, Ser. No. 671,525
Int. Cl.[2] H04B *15/00, 1/10*
U.S. Cl. 364—724 **2 Claims**



1. A time-domain filter for extracting known, digital, synchronous pulses from extraneous signals or noise comprising:

a recursive pulse signal train input;

a dynamic data storage means for receiving said input signals and which automatically retrieves said input signals that occured in past time at multiples of the pulse repetition time measured in present time and for providing time related outputs comprising:

clocking means having a frequency higher than the input signal repetition rate and wherein the clock pulses are synchronized with said input pulses, and

a multi-stage delay wherein the stages are cascaded and each stage is operated by said clocking means, each stage including at least one shift register with delay length such that the pulse input reaches the output of the shift register in slightly less than one pulse repetition time of said recursive pulse signal train input, and a window generator which expands the output from said shift register to form a bandwidth window; a programming circuit comprising:

bandwidth switching means connected to each of said window generators to provide a variable window width, and

center frequency switching means for receiving the output of said bandwidth switching means and for providing a shift register of each stage delay with the inverse number of bits of shift such that the center frequency is positioned halfway between the two window limits;

correlation logic means for receiving the time related outputs of said dynamic data storage means and for generating an output whenever a selected percentage of necessary true inputs is exceeded, said output indicating a probable valid signal; and

gating means responsive to said correlation logic means for passing said input pulse signal whenever said correlation logic means generates an output indicating a probable valid signal.

4,066,879

MEANS AND METHOD FOR CONTROLLING ELUENT GRADIENT IN LIQUID CHROMATOGRAPHY

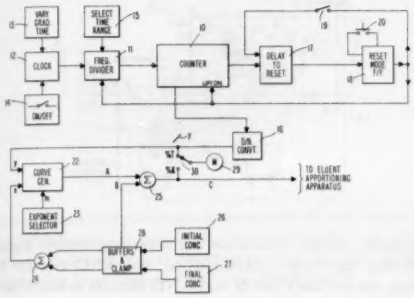
Brian E. Leaver, Lake Park, and William F. Dudley, Jr., Riviera Beach, both of Fla., assignors to Milton Roy Company, St. Petersburg, Fla.

Filed June 21, 1976, Ser. No. 698,278
Int. Cl.[2] B01D *15/08;* **G01N** *31/08;* **G06G** *7/58*
U.S. Cl. 364—498 **17 Claims**

9. A system for controlling the gradient between two eluents in a liquid chromatograph, comprising:

function generator means for producing a first, non-linear signal over a given range during a first, run period;

control means responsive to said signal for determining the instantaneous ratio of the eluents; and



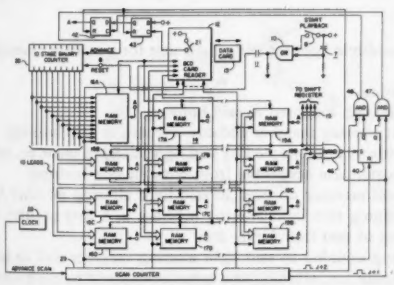
means for causing said function generator means to produce a second non-linear signal over said given range during a second, reset period which is shorter than said run period.

4,066,880

SYSTEM FOR PRETESTING ELECTRONIC MEMORY LOCATIONS AND AUTOMATICALLY IDENTIFYING FAULTY MEMORY SECTIONS

Ernest J. Salley, Phoenix, Ariz., assignor to Engineered Systems, Inc., Phoenix, Ariz.

Filed Mar. 30, 1976, Ser. No. 671,938
Int. Cl.[2] G11C *29/00*; G06F *11/00*
U.S. Cl. 235—302.3 **9 Claims**



1. A system for detecting errors and identifying error locations in read/write memory during use of such memory, including in combination:

read/write memory means for storing a plurality of binary encoded words at a plurality of address locations, each word having at least two binary bits, said memory means initially being cleared to a condition in which all of the binary bits thereof should be of the same type; identifying means coupled with said memory means and responsive to a readout of the words stored therein for identifying a faulty bit of a word at any address location which is not cleared; and

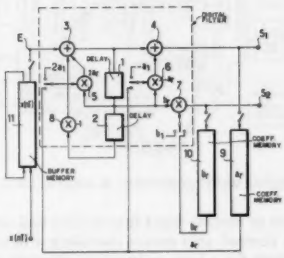
addressing means for selecting different address locations in said memory means, and means coupled with said identifying means for causing said addressing means to select a new address location upon identification of a faulty bit by said identifying means.

4,066,881

SAMPLED SIGNAL PROCESSING DEVICE

Jean-Pierre Houdard, St. Jean de la Ruelle, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Aug. 12, 1976, Ser. No. 713,947
Claims priority, application France, Aug. 13, 1975, 75.25231
Int. Cl.[2] G06F *15/34*
U.S. Cl. 364—726 **2 Claims**



1. A device for performing the discrete Fourier transform on a sequence of an arbitrary number, N, of equally spaced samples $x(nT)$ of a signal $x(t)$ to be processed, the device including a signal sample memory for the N samples x(nT), digital filter means having a transfer function H(z) with an input receiving samples from said memory to a pair of outputs, where:

$$H(z) = \frac{1 - e^{-2\pi j \frac{r}{N}} z^{-1}}{1 - 2(\cos \frac{2\pi r}{N})z^{-1} + z^{-2}},$$

and

$$\cos \frac{2\pi r}{N} = a_r \sin \frac{2\pi r}{N} = b_r$$

and r is the order of the Fourier coefficient being calculated, the digital filter being such that application of the N samples in sequence at its input causes its outputs to produce respectively the real and imaginary components of the r-th Fourier coefficient, the device further comprising a respective sine/cosine memory for storing values of a_r and b_r for different r, and the filter including multiplier means connected to respective sine/-cosine memory to introduce the appropriate values of a_r and b_r into the filter during calculation, and switch means, coupled to said filter for putting the the device into a configuration in which a respective sine/cosine memory is connected to store successive values at the filter outputs for future use as values of a_r and b_r for successive r, the multiplier means connected to an input for initial values

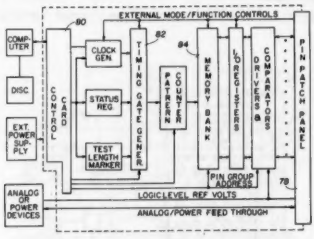
$$a_1 = \cos \frac{2\pi}{N} \text{ and } b_1 = \sin \frac{2\pi}{N},$$

and the filter input connected to receive a unit impulse function u(rT) instead of the signal samples, where $u(rT) = 1$ for R = o and o for $r \neq$ o.

4,066,882
DIGITAL STIMULUS GENERATING AND RESPONSE MEASURING MEANS

Charles M. Esposito, St. James, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,561
Int. Cl.[2] G06F *11/00*; G01R *31/28*
U.S. Cl. 235—302 **36 Claims**



1. In a digital word generator, a control card module comprising:

first means to receive input instructions and data bits from a source thereof, said means including a device to receive commands for a logic network to transmit command and flag signals to initiate and terminate a sequence of an operation scheduled by the source;

second means connected to said first means and having decoder means for decoding computer instructions;

read-write control means utilizing a plurality of serially related flip-flops, said read-write control means being operably connected and operatively connected to said decoder means;

timing means operably connected to said first means, said timing means including an oscillator means driving a binary chain providing clock and timing sequence pulses and signals, respectively;

a counter and control means for generating card select signals in accordance with signals from the read-write control means and timing means to which said counter and control means is connected;

third means to be a buffer for data from the source and the decoder to deliver signals to an output connection;

a fourth means to receive external signals and data processed by reason of the signals from the third means to interface externally generated signals and data with the control card module; and

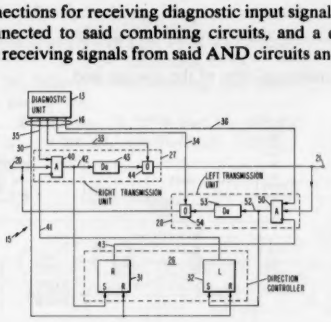
a data output means connected to said fourth means comprising a plurality of common clocked flip-flops that can be simultaneously loaded via a switching matrix to deliver data back to the source.

4,066,883
TEST VEHICLE FOR SELECTIVELY INSERTING DIAGNOSTIC SIGNALS INTO A BUS-CONNECTED DATA-PROCESSING SYSTEM

Delwyn Roche Wheeler, Jr., Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 24, 1976, Ser. No. 744,847
Int. Cl.[2] G06F *11/00*
U.S. Cl. 235—304 **11 Claims**

1. A test vehicle for a bus-connected data-processing system for selectively interjecting diagnostic signals on the bus via a pair of terminals adapted to be attached to a bus such that bus signals flow through the test vehicle via said terminals and to the exclusion of data processing signals normally on said bus characterized in that a pair of AND circuits are connected respectively to said terminals for receiving data processing signals therefrom, a pair of combining circuits respectively connected to receive signals from said AND circuits and having outputs connected to said terminals respectively not connected to said respective AND circuits, a pair of diagnostic input connections for receiving diagnostic input signals respectively connected to said combining circuits, and a direction controller receiving signals from said AND circuits and having

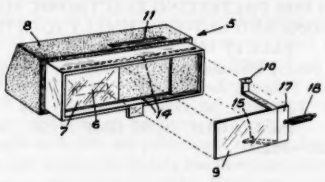


a diagnostic control connection for receiving control signals and having electrical connections to said AND circuits for enabling one and only one of said AND circuits in accordance with signals received by said direction controller.

4,066,884
MULTIPLE LIGHT INTENSITY FLASH UNIT

Robert L. Taylor, Imlaystown, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Sept. 8, 1976, Ser. No. 721,660
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—16 **7 Claims**



1. A multiple light intensity flash unit for a camera comprising:

a housing;

a flash lamp mounted in said housing;

a light altering member slidably coupled in said housing;

an actuator arm coupled to said light altering member, said actuator arm accessible from without said housing;

a detent member coupled to said light altering member for retaining said light altering member in a first position in front of said flash lamp; and

a spring coupled to said light altering member and to said housing for returning said member to a rest position away from said lamp.

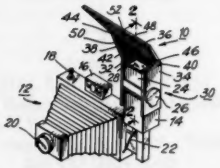
4,066,885
LIGHT EXTRACTOR-DIFFUSER

Norman Weinberg, 120-17 Debs Place, Bronx, N.Y. 10475

Filed June 25, 1976, Ser. No. 699,698
Int. Cl.[2] G03B *15/03*
U.S. Cl. 362—18 **14 Claims**

1. A light extractor-diffuser for illumination of a subject using artificial light which comprises a frame having two opposed spaced apart registered panels of substantially equal size; two triangular panels of substantially equal size, each of said triangular panels extending from intersection with a linear edge of one of said registered panels, with a base edge of each triangular panel being attached to said edge of one of said registered panels, said triangular panels diverging outwards from said frame at an angle so that the linear distance between the respective apexes of the triangular panels is greater than

the distance between said registered panels, and a substantially bilateral trapezoidal panel, said trapezoidal panel extending angularly outwards from lateral attachment to two opposed edges of said triangular panels and having a wide terminal



portion spaced away from the intersections of said trapezoidal panel with triangular panels, the narrower of the two parallel edges of said trapezoidal panel extending between opposed acute-angled base angles of said triangular panels.

4,066,886

MOTOR VEHICLE WITH HEADLAMP TILTING MECHANISM

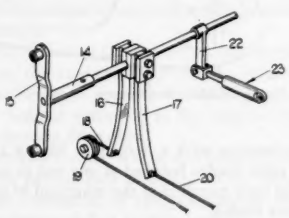
Frederick Raymond Patrick Martin, Bromley, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Sept. 5, 1975, Ser. No. 610,857

Claims priority, application United Kingdom, Sept. 26, 1974, 41825/74

Int. Cl.² B60G 1/10

U.S. Cl. 362—68 **4 Claims**



1. In a motor vehicle having a vehicle body, front and rear wheels upon which the body is suspended and a headlamp mounted on said body for upward or downward tilting movement, a headlamp tilting mechanism comprising a first element movable in response to changes in the attitude of said vehicle body relative to said front wheels, a second element movable in response to changes in the attitude of said vehicle body relative to said rear wheels, a rotatable shaft operably connected with said headlamp, a first blade spring arm connected at one of its ends to said shaft and attached at the other of its ends to said first element, and a second blade spring arm attached at one of its ends to said shaft and at the other of its ends to said second element, the arrangement being such that said first and second blade spring arms are normally biased by respective ones of said first and second members and act in opposition to each other on said shaft, said blade spring arms causing the shaft to rotate in either one direction or the other to cause the headlamp to tilt up or down in response to changing attitudes of said vehicle body.

4,066,887

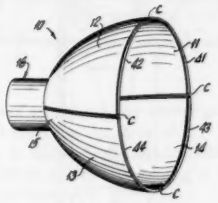
SEGMENTED SECTIONAL REFLECTION FOR THE PROJECTION OF LIGHT BEAMS AND ITS METHOD OF PRODUCTION

Maurice Levis, 201 F 77 St., Apt. 7F, New York, N.Y. 10021

Filed Oct. 27, 1976, Ser. No. 736,237

Int. Cl.² F21V 7/00; G02B 5/10

U.S. Cl. 362—341 **15 Claims**



1. A projection system including a reflector, a light source positioned to illuminate the reflector, a film support having an aperture through which aperture light passes from the reflector, a projector lens and a screen, in which system the reflector comprises at least three reflector sectors;

each of said reflector sectors being a sector of a common deep-dish ellipse and having an original common axis, said sectors being radially outwardly translated relative to said common axis in the range of arc tan

$$\frac{0.1L}{FF'} < \theta < \text{arc tan } \frac{0.8L}{FF'}$$

where L is the shortest length of the aperture, θ is the angle of translation taken relative to the original axis, F is the primary focal point of the original deep-dish ellipse and F′ is the secondary focal point of the original deep-dish ellipse;

said sectors each forming in at least one imaginary vertical plane cross-sectional to said original axis a circular line for each sector, said circular lines for the different sectors having different centers and having imaginary crossings in said plane if said lines are extended.

8. The method of forming a reflector for use in a projector system, said method comprising the following steps:

a. forming a bendable metal reflector material into the shape of a deep-dish ellipse having a primary focal point and an axis;

b. slitting said ellipse reflector into at least three reflector sectors, said slits starting at the outer edge and terminating at predetermined points at equal distances from the apex of said ellipse;

c. transposing the outer edges of each of the reflector sectors radially outward a distance in the range of arc tan

$$\frac{0.1L}{FF'} < \theta < \text{arc tan } \frac{0.8L}{FF'}$$

where L is the shortest length of the aperture, θ is the angle of translation taken relative to the original axis, F is the primary focal point of the original deep-dish ellipse and F′ is the secondary focal point of the original deep-dish ellipse; and

d. clamping the outer edges of the reflector in their transposed position.

4,066,888

ENCLOSED HIGH-PRESSURE ELECTRIC DISCHARGE LAMP STRUCTURE WITH CABLE TERMINAL

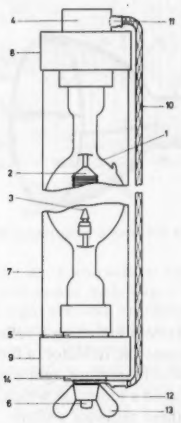
Michael Gassmann, Munich, Germany, assignor to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH, Munich, Germany

Filed July 6, 1976, Ser. No. 702,982

Claims priority, application Germany, July 14, 1975, 7522386[U]

Int. Cl.[2] F21S *3/00*

U.S. Cl. 362—223 9 Claims



1. Double-ended, elongated high-pressure electric discharge lamp having a pair of terminals, a lamp base (**4, 5**) at either end of the lamp, the bases being connected to respective lamp terminals, a connecting pin or bolt (**6**) at one base (**5**), a connection cable (**10**) rigidly mounted to and connected to the other base (**4**) in combination with a removable protective transparent tube (**7**) of insulating material enclosing the lamp, end caps (**8, 9**) fitted over both ends of the lamp, at least one end cap (**9**) having a central opening, the pin or bolt (**6**) extending through one (**19**) of the caps, wherein

the connection cable (**10**) is passed close to and along the outer wall surface of the tube in stretched condition and has a length to extend from said other base (**4**), up to the pin or bolt (**6**) of said one lamp base (**5**), said cable being detachably secured to the pin or bolt (**6**) immediately adjacent the respective end cap (**9**).

4,066,889

ILLUMINATED SKI POLE

David A. Hodgson, Hamburg, N.Y., assignor to International Power Pole, Ltd., Hamburg, N.Y.

Filed Nov. 22, 1976, Ser. No. 744,283

Int. Cl.[2] F21V *33/00*

U.S. Cl. 362—102 5 Claims

1. In a ski pole, a tubular body member, an arcuate window element of transparent or translucent material set into the wall of said tubular body member to form a smooth continuation of the outer wall thereof, a light source within said tubular body member to illuminate said window element and project light lengthwise in the interior of said body member, a lens in the wall of said body member relatively remote from said window element in an axial direction and a mirror element adjacent to

said lens for reflecting said projected light through said lens member to be emitted laterally of said ski pole.

4,066,890

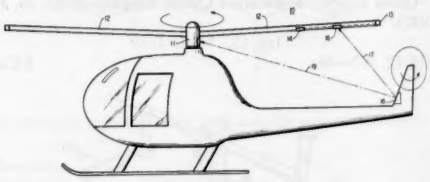
ROTOR TIP LIGHT CONTROL

Charles W. Hamilton, Colonia, and Alfred Kleider, Ocean, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 24, 1976, Ser. No. 726,364

Int. Cl.[2] H04B *9/00*

U.S. Cl. 250—199 8 Claims



1. In combination with a helicopter having a shaft and a plurality of rotor blades fastened at one end to said shaft;

A rotor tip light mounted to the other end of at least one of said rotor blades;

means mounted to said one rotor blade for supplying electrical current to said rotor tip light;

means mounted to said rotor blade for controlling said current to said rotor tip light in a plurality of selective discrete incremental levels to change the intensity of said light; and

means mounted on the main body of said helicopter and synchronized with the rotation of said rotor blades for transmitting coded optical signals to said controlling means to instruct the same to selectively apply said incremental levels of current to said rotor tip light.

4,066,891

GEOCHEMICAL AND GEOPHYSICAL EXPLORATION

Peter R. Gray, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 6, 1976, Ser. No. 712,297

Int. Cl.[2] G01V *5/00*

U.S. Cl. 250—253 7 Claims

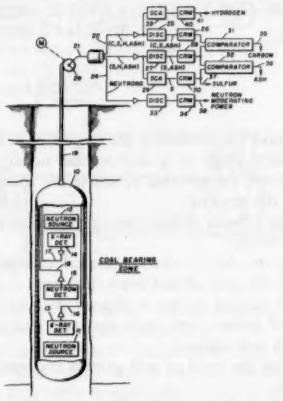
1. A process of prospecting for subterranean formations comprising

a. procuring earth samples from the earth at a depth of about 2 inches to about 5 feet below the earth surface, and
b. determining the Po210 concentration of these samples.

4,066,892
COAL LOGGING SYSTEM

Wyatt W. Givens, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,441
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—270 15 Claims

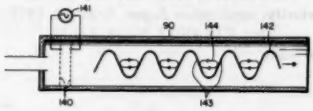


1. A system for logging a coal-bearing formation traversed by a borehole, comprising:
a. a borehole tool,
b. means for locating said borehole tool adjacent a coal-bearing formation,
c. a first neutron source located within said borehole tool for irradiating the coal-bearing formation with neutrons of energy sufficient to produce 4.43-Mev gamma rays from inelastic neutron scattering in the carbon component of the coal-bearing formation,
d. a first detector located within said borehole tool for measuring the gamma rays returning to the borehole in response to irradiation of the coal-bearing formation by neutrons from said first neutron source,
e. a second neutron source located within said borehole tool at a spaced-apart position from said first neutron source for irradiating the coal-bearing formation with neutrons of energy insufficient to produce a significant number of 4.43-Mev gamma rays from inelastic neutron scattering in the carbon component of the coal-bearing formation,
f. a second detector located within said borehole tool for measuring the gamma rays returning to the borehole in response to irradiation of the coal-bearing formation by neutrons from said second neutron source,
g. means for producing a first count of those gamma rays measured by said first detector that are of an energy level above the energy level of the gamma rays produced by the hydrogen component of the coal-bearing zone,
h. means for producing a second count of those gamma rays measured by said second detector that are of an energy level above the energy level of the gamma rays produced by the hydrogen component of the coal-bearing zone, and
i. means for determining the differential between said first and second counts as an indication of the carbon content of the coal-bearing formation.

4,066,893
ISOTOPE SEPARATION BY ION WAVES

John Myrick Dawson, Pacific, Palisades, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 562,993, March 27, 1975. This application Feb. 17, 1976, Ser. No. 658,565
Int. Cl.[2] H01J *39/31*
U.S. Cl. 250—282 4 Claims

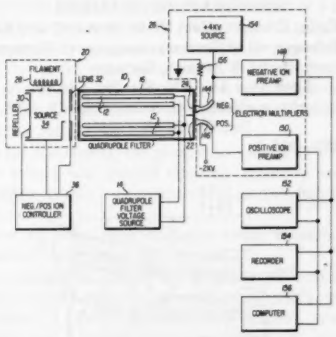


1. The method of separating one isotope of an element from the others which comprise the steps of:
a. generating a dense, substantially electrically neutral plasma including an element having at least two ionized isotopes to be separated;
b. maintaining each volume at a different electric potential and
c. maintaining each volume at a different electric potential and
d. generating a plasma shock wave in one of the volumes, whereby an ion wave is launced and the ionized isotope of the smaller mass is preferentially scattered by the propagating wavefront of the ion wave, while the ionized isotope of greater mass is capable of passing the wavefront, thereby to separate the isotopes.

4,066,894
POSITIVE AND NEGATIVE ION RECORDING SYSTEM FOR MASS SPECTROMETER

Donald F. Hunt, and George C. Stafford, Jr., both of Charlottesville, Va., assignors to University of Virginia, Charlottesville, Va.

Filed Jan. 20, 1976, Ser. No. 650,783
Int. Cl.[2] H01J *39/34*
U.S. Cl. 250—292 13 Claims



1. A method of generating and monitoring positive and negative ions substantially simultaneously using a quadrupole mass spectrometer having an ion generator with repeller, source and lens electrodes, and a quadrupole filter, comprising the steps of:
operating the mass spectrometer under conditions favoring the generation of positive and negative ions;
alternately transmitting the positive ions and the negative ions at a frequency in excess of 1 kHz, through the quadrupole filter; and
separately extracting the alternately transmitted positive

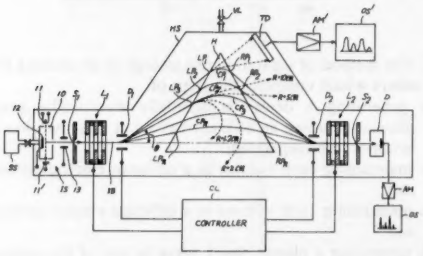
ions and negative ions at the output of the quadrupole filter.

4,066,895

SCANNING MASS SPECTROMETER HAVING CONSTANT MAGNETIC FIELD

Masaya Iwanaga, Kyoto, Japan, assignor to Shimadzu Seisakusho Ltd., Kyoto, Japan

Filed Sept. 8, 1976, Ser. No. 721,438
Claims priority, application Japan, Sept. 12, 1975, 50-111075
Int. Cl.[2] H01J *39/34, 37/26*
U.S. Cl. 250—296 **19 Claims**



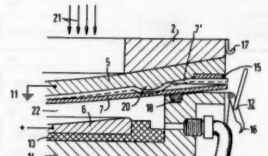
1. A mass spectrometer comprising an ion source for producing and ion beam of a sample; an analyzer including a constant magnetic field having at least a first end face at which said ion beam enters said magnetic field and a second end face at which said ion beam emerges out of said magnetic field; means for detecting ions; and means for deflecting said ion beam for scanning of the mass spectrum or selection of predetermined mass numbers of said sample, said ion beam deflecting means being provided between said ion source of said magnetic field so that as said ion beam is deflected, the point or angle of incidence on said first end face at which said ion beam enters said magnetic field is changed so as to change the radius of curvature of the trajectory of the ion that enters said ion detecting means.

4,066,896

IONOGRAPHIC CHAMBER

Gerhard Kuhn, Erlangen; Karl Ubler, Spardorf, and Karl-Hans Reiss, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 13, 1976, Ser. No. 686,801
Claims priority, application Germany, June 19, 1975, 2527253
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—315 A **7 Claims**



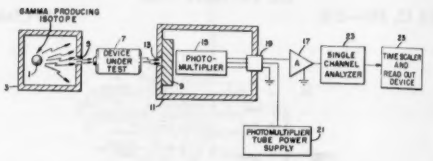
1. An ionography chamber with spherically curved first and second electrodes comprising, in combination, an electrically insulating sheet between said curved electrodes and covering said first electrode; means for applying an electrical potential between said electrodes; said first electrode having depression or projection contouring near its edge covered by a portion of said sheet; means forming a chamber between the sheet and the second electrode; and means for admitting a gas into said chamber between said sheet and the second electrode and means generating a pressure dfference whereby the pressure between said first electrode and said sheet is less than the pressure in said chamber between the sheet and the second electrode.

4,066,897

CHEMICAL CHANGE MEASURING APPARATUS

Ralph L. Belcher, 10603 Lorain Ave., Silver Spring, Md. 20901, and Harry R. Wood, 13331 Query Mill Road, Gaithersburg, Md. 20760

Filed Feb. 25, 1976, Ser. No. 661,107
Int. Cl.[2] G01N *23/06*
U.S. Cl. 250—358 R **25 Claims**



1. A method for measuring the degree of chemical change that has taken place in a device that undergoes chemical change wherein the reaction products are spatially separated comprising the steps of:

a. utilizing a beam of low energy gamma rays of a known energy level;

b. placing the device whose chemical change is to be measured in the path of said beam of gamma rays such that an element of said device is aligned with said path of said beam of gamma rays such that said gamma rays travel through said element;

c. detecting the level of said gamma rays exiting from said element;

d. generating electrical signals in response to the detected level of said gamma rays exiting from said element;

e. electronically processing said generated electrical signals to produce measuring signals indicative of the degree of chemical change that has taken place in said device;

f. producing a read out; and

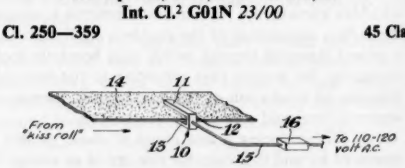
g. correlating said read out with a known value obtained before said device that undergoes a chemical change has undergone any chemical change to thereby obtain a measure of the change that has taken place in said device that undergoes a chemical change.

4,066,898

METHOD AND APPARATUS FOR MONITORING AMOUNT OF A SUBSTANCE APPLIED TO A FABRIC

Arthur J. Kamp, and Philip G. Mischler, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 12, 1976, Ser. No. 676,036
Int. Cl.[2] G01N *23/00*
U.S. Cl. 250—359 **45 Claims**



1. An apparatus capable of determining the amount of a substance applied to a fabric matrix, said substance being characterized as containing atoms of a non-radioactive element of atomic number **11** or greater, comprising:

a. a source of radiation which, within the range of from about 12 to about 19 Kev, emits a single predominant, monoenergetic radiation;

b. Spaced apart from the source and aligned so as to receive

radiation from the source, a charge pulse detector having a resolution at least as sharp as about 20 percent, within the range of from about 12–19 Kev, which detector is sensitive to the predominant radiation from the source and which generates a pulse output which varies in amplitude with the energy of the instant radiation, said matrix being positioned between the source and the detector;

c. readout means; and

d. electronic circuit means connected to said detector for relating the detector output to the amount of substance in the matrix, and for generating a signal in said readout means in response to said relationship.

4,066,899

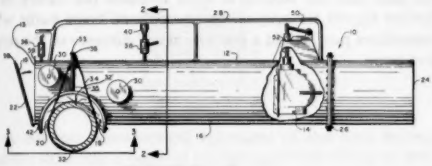
UNDERWATER RADIOGRAPHIC SYSTEM

Randle Gaspar, Rte. 2, Box 7, and Claud A. Burk, Rte. 2, Box 43 B, both of Luling, La. 70070

Filed Sept. 13, 1976, Ser. No. 722,570

Int. Cl.[2] G01N *23/00*; G03B *41/16*

U.S. Cl. 250—358 P **10 Claims**



1. An apparatus for making radiographic pictures of an object submerged in a liquid, comprising:

a. a substantially watertight elongated housing, said housing being provided with a lateral, recessed saddle, said housing being attachable to said object at said recessed saddle;

b. camera means for irradiating said object with a beam of X-rays, said camera means being encased and rigidly supported within said watertight housing, said camera means positioned at a point in said housing substantially removed from said recessed saddle in the longitudinal direction; and

c. sensitized film means for making radiographs encased in said housing at the opposite end portion of said housing from said camera means, said film means oriented so that at least a portion of said recessed section is between said radiation means and said film means.

4,066,900

TECHNIQUE FOR CAT UTILIZING COMPOSITE BEAM PATHS WHICH ARE WIDER AT THEIR ENDS THAN THEREBETWEEN

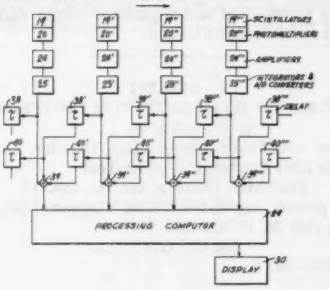
Christopher Archibald Gordon LeMay, Osterley, England, assignor to EMI Limited, Hayes, England

Continuation-in-part of Ser. No. 668,518, March 19, 1976, Pat. No. 4,031,395. This application June 21, 1976, Ser. No. 698,047

Int. Cl.[2] A61B *6/02*; G01N *23/08*

U.S. Cl. 250—360 **14 Claims**

1. An apparatus for examining a body by means of penetrating radiation including means for generating output signals, representative of the absorption suffered by the radiation in passage along respective beam paths through a region of the body, for processing to provide a representation of the distribution of absorption of the radiation in the region, and combining means for combining groups of output signals relating to groups of beam paths, chosen so that the beam paths of a group are inclined to one another and pass through a common elemental area of the region, to provide composite output signals representing the absorption of the radiation in passage through the body along composite beam paths which are narrower in the vicinity of the respective elemental areas than in other parts of the region, so that said processing can be effected on a



plurality of output signals including at least some of said composite output signals.

4,066,901

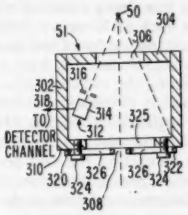
TOMOGRAPHIC SCANNING APPARATUS WITH IMPROVED COLLIMATOR STRUCTURE

Edward J. Seppi, and Frederick V. Murphy, both of Menlo Park, Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Sept. 13, 1976, Ser. No. 722,930

Int. Cl.[2] A61B *6/02*; G01N *23/08*; H05G *1/30*

U.S. Cl. 250—360 **3 Claims**



1. Apparatus for examining a bodily portion of a patient by means of penetrating radiation and providing a digital output signal for use in reconstruction of a two-dimensional representation of the bodily structure residing in a thin section taken through said body portion; said apparatus comprising:

an assembly rotatable about an axis extending along a central opening defined there;

means for positioning the portion of said body to be examined within said central opening, whereby said axis of assembly rotation is substantially perpendicular to said section;

a source of penetrating radiation being mounted on said assembly toward one side thereof;

a first collimating means being mounted proximate said source toward said one side of said assembly, said means including a first relatively wide opening toward said source, and a spaced relatively narrow slit aligned with said first opening, the radiation emerging from said slit being in the configuration of a fan beam;

detector means for said radiation positioned on said assembly opposite said source for detecting radiation progressing laterally across said section and not absorbed by said body portion;

means for rotating said assembly whereby said fan beam impinges upon said body portion at a plurality of incident directions:

signal processing and conditioning means mounted on said assembly and movable therewith, for receiving the output

signals from said detector means and amplifying and converting said signals to digital form; and

first interconnection means for receiving the outputs from said signal processing and conditioning means and enabling interfeed of said digitalized output signals to an image reconstruction station.

4,066,902

RADIOGRAPHY WITH DETECTOR COMPENSATING MEANS

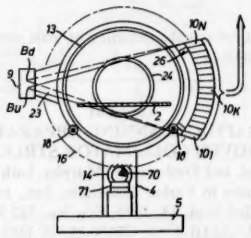
Christopher Archibald Gordon LeMay, Osterley, England, assignor to EMI Limited, Hayes, England

Filed Mar. 19, 1975, Ser. No. 559,715

Claims priority, application United Kingdom, Mar. 23, 1974, 13018/74; July 26, 1974, 33033/74

Int. Cl.² G01T *1/20*

U.S. Cl. 250—363 S **6 Claims**



6. An apparatus for examining a slice of a body by means of penetrating radiation such as X- or γ - radiation including a source of a substantially planar fan of radiation intersecting the said slice and originating substantially from a point, a plurality of detectors for detecting the radiation after passage through the body along a plurality of beams at different angles within the fan, means for angularly displacing at least the source through a substantial angle about an axis which intersects the slice, and means for subjecting the said point of origin to a periodic displacement, of period short compared with the time of said angular displacement, relative to the detectors and in the plane of said fan.

4,066,903

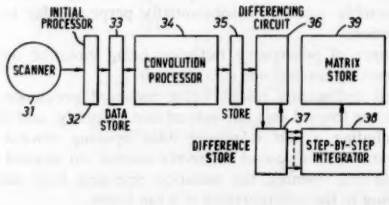
RADIOLOGY

Christopher Archibald Gordon LeMay, Osterley, England, assignor to EMI Limited, Hayes, England

Continuation of Ser. No. 596,623, July 17, 1975, Pat. No. 4,002,910. This application Oct. 26, 1976, Ser. No. 735,745

Int. Cl.² G01M *21/34*

U.S. Cl. 250—363 S **2 Claims**



1. Medical radiographic apparatus, for constructing a representation of the distribution of a characteristic of a body with respect to penetrating radiation transmitted through a slice of a body of a patient including: radiographic examination means for providing data signals representing the intensity of radiation transmitted through the material of the body in different directions in the slice; initial processor means co-operating with the said radiographic examination means for converting the said data signals into a plurality of signals each representing the line integral of absorption of the radiation by material along a respective one of a plurality of beam paths in the slice, the paths being distributed in a plurality of sets of substantially parallel paths; data store means for storing the said signals representing line integrals at locations corresponding to the respective paths; processor means for modifying the said signals representing line integrals in response to other signals representing line integrals along paths of the same set of parallel paths to form further signals suitable for combination to provide the said representation; differencing circuit means for forming difference signals, for the further signals of each set of parallel paths, representing the differences of the further signals of the respective set extending to order m, where m is at least two; integrator means for providing interpolated difference signals and for combining the said interpolated difference signals by a process of recurrent addition to provide interpolated further signals, of the same form as the said modified line integrals but corresponding to paths interpolated between and parallel to the paths of the respective set; and matrix store means having a plurality of locations associated with a plurality of predetermined points in a field notionally delineated in the slice and for storing at each location the values of the further signals for original or interpolated beam paths whose centrelines pass within a predetermined distance of the respective point.

4,066,904

METHOD OF MEASUREMENT OF THE CONCENTRATION OF A SUBSTANCE CONTAINED IN A GAS AND DEVICES FOR CARRYING OUT SAID METHOD

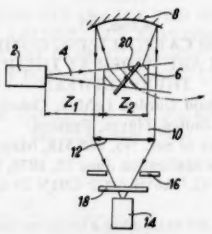
Jean-Loup Bertaux, Sevres, and Jacques Alain Quessette, Paris, both of France, assignors to Agence Nationale de Valorisation de la Recherche Anvar, Neuilly-sur-Seine, France

Filed May 6, 1976, Ser. No. 683,649

Claims priority, application France, May 14, 1975, 75.14952; Oct. 24, 1975, 75.32644

Int. Cl.² G01N *21/22*

U.S. Cl. 250—372 **19 Claims**



1. A method of measurement of the concentration of a photodissociable substance contained in a gas, wherein:

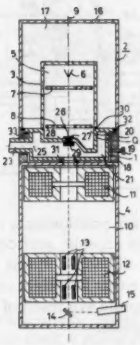
a gas having an unknown content of photodissociable substance is irradiated with a radiation having a sufficiently short wavelength to photodissociate said substance,

a photometric measurement is carried out on at least one of the photodissociation products in order to determine its concentration under conditions under which the concentration of the photodissociation product is proportional to the concentration of the substance to be measured.

4,066,905
PARTICLE BEAM APPARATUS WITH ZONES OF DIFFERENT PRESSURE

Joachim Dassler; Lee H. Veneklasen, and Martin Zschimmèr, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Mar. 24, 1976, Ser. No. 669,804
Claims priority, application Germany, Mar. 27, 1975, 2514266
Int. Cl.[2] H01J *37/26*
U.S. Cl. 250—396 R 7 Claims



1. A particle beam optical apparatus of the type having means for directing a beam of charged particles along an axis, a housing surrounding the particle beam axis, and means located at an intermediate position along the beam axis for dividing the housing into two subspaces following sequentially along the beam axis, one of the subspaces being adapted to be evacuated to a first low pressure, and the other being adapted to be evacuated to a second low pressure higher than the first low pressure, wherein the means for dividing the housing into two subspaces comprises:

a pressure stage having a body that is detachably mounted in vacuum-tight relation to the housing at said intermediate position, the pressure stage including

a vacuum-tight partition dividing said body into a first portion communicating with the one subspace and a second portion communicating with the other subspace,

a first conduit leading from said first portion through the body and adapted for connection to a means for evacuating the one subspace to said first low pressure, and

a second conduit leading from said second portion through the body and adapted for connection to a means for evacuating the other subspace to said second low pressure,

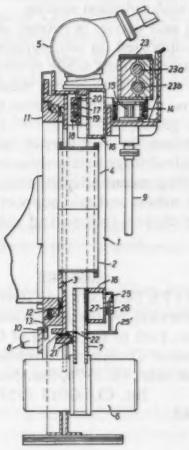
the centerlines of said first and second conduits lying approximately in a common plane perpendicular to the beam axis.

4,066,906
SCANNING RADIOGRAPHIC APPARATUS

Godfrey Newbold Hounsfield, Newark, and Peter George Langstone, Gerrards Cross, both of England, assignors to EMI Limited, London, England

Filed June 2, 1976, Ser. No. 692,182
Claims priority, application United Kingdom, June 11, 1975, 25112/75
Int. Cl.[2] G01N *23/00*
U.S. Cl. 250—445 T 10 Claims

1. Radiographic apparatus including means defining a patient position, a source of penetrating radiation, such as X-radiation, arranged to project said radiation through said patient position along at least one beam path, scanning means for scanning the source of said radiation angularly and laterally relative to the patient position so as to project said radiation therethrough along further beam paths displaced angularly and/or laterally from said at least one beam path, a sensing arrangement for sensing the progress of said lateral scanning and for providing timing signals indicative thereof, detecting means including at least one detector device for detecting the amount of said radiation emergent from said patient position along each of said beam paths and for producing output signals indicative of said amounts, circuit means connected to receive

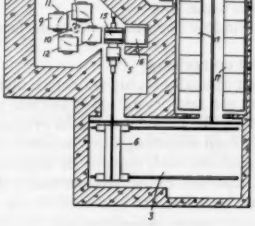


said timing signals and said output signals and adapted to utilise said timing signals to determine, at least in part, the effective widths of said beam paths to which said output signals relate, and means for varying a characteristic of said timing signals to change the effective widths of said paths.

4,066,907
GAMMA IRRADIATION PLANT

Karl-Heinz Tetzlaff, No. 3, Morikestrasse, 6233 Kelkheim, Germany

Filed Jan. 15, 1976, Ser. No. 649,601
Claims priority, application Germany, Jan. 15, 1975, 2501381
Int. Cl.[2] G01M *21/00*
U.S. Cl. 250—453 7 Claims



1. A gamma irradiation plant for irradiating goods, comprising:

a. a carrier mounted for rotation about a central axially positioned source of radiation;

b. a plurality of support means mounted on said carrier for rotation about separate satellite axes spaced from each other and spaced radially about said central axis, said satellite axes being substantially parallel to said central axis;

c. at least two support shelves mounted on each of said support means for supporting said goods;

d. a plurality of shielding means, each mounted on said carrier along a radius extending from said central axis through the space between said support shelves mounted on adjacent of said support means, said shielding means being adapted to attenuate the radiation from said source, the attenuating effect being greater with increasing distance from said radiation source;

e. whereby as said carrier is rotated about said central axis the goods supported on said support shelves are rotated about said satellite axes while revolving about said radiation source and said shielding means serve to make the radiation dose more uniform across a given cross-sectional area of said goods; and

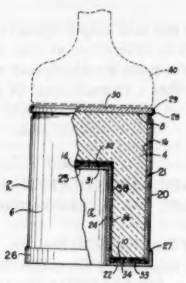
f. a housing means for carrier, said housing means including article storage means remote from said carrier and article handling means adapted to transfer goods between said storage means and said support shelves and between said support shelves to load and unload goods.

4,066,908

WELL-TYPE SCINTILLATION ASSEMBLY

Mohammad R. Farukhi, Willoughby; George A. Mataraza, and Oley D. Wimer, both of Euclid, all of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Filed Mar. 31, 1976, Ser. No. 672,206
Int. Cl.[2] G01J *1/58*
U.S. Cl. 250—483 **15 Claims**



1. In a well-type scintillation assembly including

a. an inorganic scintillation crystal in the shape of a right cylinder having a front face, a back face, and a well extending axially in from the back face toward the front face but terminating short thereof,

b. a housing conforming to the shape of said crystal and enclosing the same, and

c. an optical window coupled to the front face of said crystal,

the improvement comprising

a. a layer of an optically highly reflective material between said housing and said crystal along the side portion of said well and along the back face of said crystal, and

b. an optically high adsorbing filter between said housing at the bottom of said well capable of uniformly adsorbing between 10 and 90% of the light emitted in the area of said crystal near the bottom of said well.

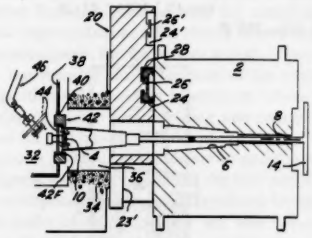
4,066,909

CONTAINER FOR RADIOACTIVE OBJECTS

Claude Bourdois, Palaiseau; Charles Glachet, Vendome; Paul Marchal, Gif-sur-Yvette, and Jean Vertut, Issy-les-Moulineaux, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 1, 1976, Ser. No. 728,841
Claims priority, application France, Oct. 3, 1975, 75.30442
Int. Cl.[2] G21F *5/02*
U.S. Cl. 250—497 **14 Claims**

1. A container for radioactive objects of the type comprising on the one hand a shielded body provided with an internal cavity and on the other hand a capsule which can be inserted into said cavity, said capsule which is sealed on its front face by means of a removable door and the rear face of which is rigidly fixed to an operating rod being capable of sliding along the axis of said cavity through one of its extremities, wherein said cavity is sealed beyond the front face of said capsule by means



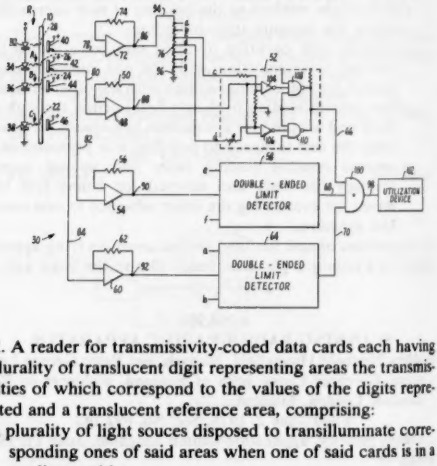
of a shielded element for positioning a cover opposite to the removable door of said capsule, said cover being capable of cooperating with corresponding means arranged within said capsule so as to permit either leak-tight coupling or uncoupling of the cover and the capsule as a result of relative movement of said cover and said capsule.

4,066,910

TRANSMISSIVITY-CODED DATA CARD SYSTEMS

David Merton Swift, Palo Alto, Calif., assignor to Lawrence Systems, Inc., San Francisco, Calif.

Filed Apr. 9, 1976, Ser. No. 675,467
Int. Cl.[2] G06K *7/10*
U.S. Cl. 250—555 **20 Claims**



1. A reader for transmissivity-coded data cards each having a plurality of translucent digit representing areas the transmissivities of which correspond to the values of the digits represented and a translucent reference area, comprising:

a plurality of light souces disposed to transilluminate corresponding ones of said areas when one of said cards is in a reading position;

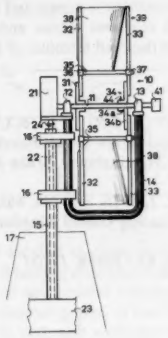
a plurality of photosensors disposed to receive light emerging from corresponding ones of said areas and to produce output currents proportional to the intensity of the received light; and

classifying means for classifying data cards positioned in said reading position in accordance with the output currents of the photosensors juxtaposed to said digit representing areas compared with corresponding ranges of percentages of the output current of the photosensor juxtaposed to said reference area.

4,066,911
WIND-DRIVEN PRIME MOVER

Douglas P. Sarchet, Apt. 6C, 143-06 Barclay Ave., Flushing, N.Y. 11355

Filed Oct. 4, 1976, Ser. No. 728,927
Int. Cl.[2] F03D 9/00; H02P 9/04
U.S. Cl. 290—44 12 Claims

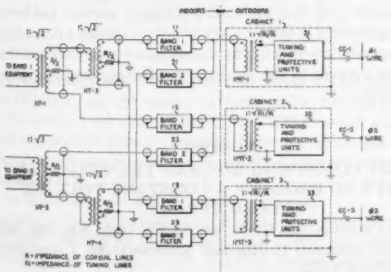


1. An adjustable wind-driven prime mover comprising a rotatably mounted drive shaft, a plurality of radially extending front masts connected to said drive shaft, a corresponding plurality of rear masts movably mounted on the drive shaft and extending radially outward therefrom, a corresponding plurality of boom members, each boom member being pivotally connected to a front mast and movably connected to a rear mast with the rear mast free to move longitudinally along and to rotate about its associated boom, each associated set of a front mast, rear mast and boom member forming a sail member supporting assembly, a corresponding plurality of sail members each being mounted on one of said sail member support assemblies, means for moving said rear masts relative to said front masts to adjust the area of the sail members facing into the wind, and means for controlling the operation of said moving means.

4,066,912
COUPLING ARRANGEMENT FOR POWER LINE CARRIER SYSTEMS

Daniel L. Wetherell, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Apr. 21, 1976, Ser. No. 678,962
Int. Cl.[2] H04M 11/00
U.S. Cl. 307—3 8 Claims



1. An improved arrangement for coupling first and second separated frequency bands to each of first, second, and third phase wires of a power transmission line comprising:

a. a first hybrid transformer having an input for said first frequency band and first and second outputs coupled thereto;

b. a second hybrid transformer having an input for said second frequency band and first and second outputs coupled thereto;

c. a third hybrid transformer having an input coupled to said first output of said first hybrid transformer and having first and second outputs coupled thereto;

d. a fourth hybrid transformer having an input coupled to said second output of said second hybrid transformer and having first and second outputs coupled thereto;

e. first, second, and third filters for said first frequency band;

f. fourth, fifth, and sixth filters for said second frequency band;

g. means connecting said first filter between said first output of said third hybrid transformer and said first phase wire;

h. means connecting said second filter between said second output of said first hybrid transformer and said second phase wire;

i. means connecting said third filter between said second output of said third hybrid transformer and said third phase wire;

j. means connecting said fourth filter between said first output of said fourth hybrid transformer and said first phase wire;

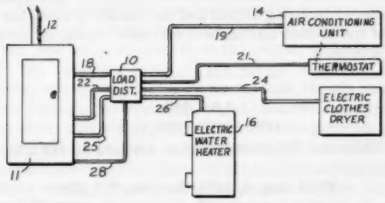
k. means connecting said fifth filter between said first output of said second hybrid transformer and said second phase wire;

l. and means connecting said sixth filter between said second output of said fourth hybrid transformer and said third phase wire.

4,066,913
ELECTRIC LOAD DISTRIBUTOR

Michael L. Manning, 155 Lakeforest Drive; Thurman L. Anglin, 31 N. Stratford Drive, both of Athens, Ga. 30601, and Richard F. Grayson, Union Church Road, Watkinsville, Ga. 30677

Continuation-in-part of Ser. No. 611,526, Oct. 7, 1975, abandoned. This application July 19, 1976, Ser. No. 706,773
Int. Cl.[2] H02J 3/00
U.S. Cl. 307—38 10 Claims

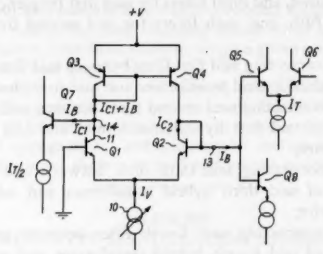


1. In an electric distribution system including a panel having a plurality of circuits, a power supply to said panel, and a plurality of loads connected to said plurality of circuits, a first load of said plurality of loads being the only load on a first circuit of said plurality of circuits, and a second load of said plurality of loads being the only load on a second circuit of said plurality of circuits, the improvements comprising a load distributor connected into said first circuit and said second circuit, said load distributor including a first circuit interrupting means for interrupting said first circuit between sad panel and said load, and a second circuit interrupting means for interrupting said second circuit between said panel and said second load, and disabling means for causing said second circuit interrupting means to interrupt said second circuit while said first circuit is completed to said first load, said disabling means including detecting means for determining when said first circuit is completed to said first load, and switch means responsive to said detecting means for interrupting said second circuit.

4,066,914
ELECTRICALLY VARIABLE IMPEDANCE CIRCUITS

Kenneth James Gundry, San Francisco, Calif., assignor to Dolby Laboratories, Inc., San Francisco, Calif.

Filed Oct. 27, 1976, Ser. No. 735,957
Claims priority, application United Kingdom, Oct. 31, 1975, 45199/75
Int. Cl.² H03K *5/08*
U.S. Cl. 307—237 **5 Claims**

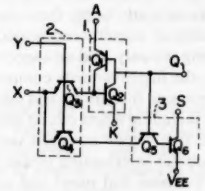


1. An electrically variable impedance circuit comprising first and second circuit branches having a point common thereto, a source of a variable control current feeding said first and second circuit branches in parallel, a circuit connected to said two branches and tending to equalize the currents in said two branches, each branch including at least one three-terminal semiconductor device having first, second and further terminals and connected in the branch by way of said first and second terminals, said further terminals of said devices being interconnected via junctions of the two semiconductor devices and said point common to said two branches, said junctions being connected back to back and variably forward biased by said control current to provide a controlled impedance between a first one of said further terminals corresponding to the first branch and serving as a voltage reference and the second one of said further terminals corresponding to said second branch serving as an input terminal, and the improvement comprising a first further semiconductor device connected to said first branch to pass a predetermined current establishing an offset between the current in that branch as determined by said current equalizing circuit and the current passing between said first and second terminals of said semiconductor device in said first branch.

4,066,915
MEMORY CIRCUIT

Ichiro Ohhinata, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 6, 1976, Ser. No. 712,261
Claims priority, application Japan, Aug. 9, 1975, 50-96999
Int. Cl.² G11C *11/34*; H03K *17/72*
U.S. Cl. 307—238 **9 Claims**

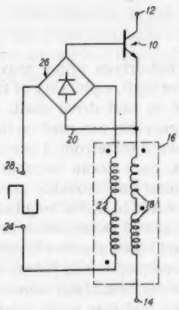


1. A memory circuit comprising a memory cell of PNPN-equivalent 4-layer construction with a write terminal and a read terminal, selective input means composed of a pair of an NPN transistor and PNP transistor, and read-out means having two input terminals for reading information stored in said memory cell, wherein the emitters of said NPN transistor and said PNP transistor included in said selective input means are connected to one of two selective input terminals, the bases of said transistors are connected to the other of said two selective input terminals, the collector of one of said transistors is connected to the write terminal of said memory cell, and the collector of the other transistor is connected to one of the two input terminals of said read-out means and the other input terminal is connected to the read terminal of said memory cell.

4,066,916
TRANSISTOR DRIVE CIRCUITS

Kenneth Gordon King, and Derek Ernest Burch, both of London, England, assignors to Westinghouse Brake & Signal Co. Ltd., England

Filed Mar. 2, 1976, Ser. No. 663,246
Claims priority, application United Kingdom, Mar. 25, 1975, 12491/75
Int. Cl.² H03K *17/00*
U.S. Cl. 307—253 **24 Claims**



1. A transistor drive circuit for driving a transistor having base, emitter, and collector electrodes, comprising a direct current current-transformer having primary windings and secondary windings, a source of alternating current, rectifying means, means for connecting the primary windings in series with the collector-emitter path of the transistor to carry the collector current flowing therein, and means for connecting the source of alternating current in a series circuit with the secondary windings and through the rectifying means to the base-emitter path of the transistor to supply the base current flowing therein, the secondary windings being connected in a polarity sense such that increasing collector current and hence increasing current in the primary windings causes a decreasing of the impedance presented by the secndary windings and thus increasing current in the secondary windings and increasing base current.

4,066,917
CIRCUIT COMBINING BIPOLAR TRANSISTOR AND JFET'S TO PRODUCE A CONSTANT VOLTAGE CHARACTERISTIC

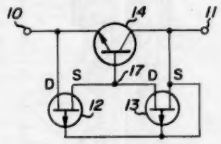
James B. Compton, Los Gatos, and Sam S. Ochi, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 3, 1976, Ser. No. 682,290
Int. Cl.² H01L *29/80, 27/02*; H03K *17/60*
U.S. Cl. 307—304 **4 Claims**

1. An integrated circuit having both bipolar transistors and FET devices integrated on a common substrate and having a portion thereof that develops a constant volage when a current is passed in excess of a predetermined value, said portion comprising;

a bipolar transistor having emitter, base, and collector regions;

a first FET located in close proximity with said bipolar transistor and having a drain region in common with said base region of said bipolar transistor, a source region coupled to said collector region of said bipolar transistor, and a gate region in common with said collector region of said bipolar transistor;



a second FET located in close proximity with said bipolar transistor and having a source region in common with said base region of said bipolar transistor, a drain region coupled to said emitter region of said bipolar transistor, and a gate region in common with said collector region of said bipolar transistor;

means to electrically isolate said portion from the remainder of said integrated circuit, and

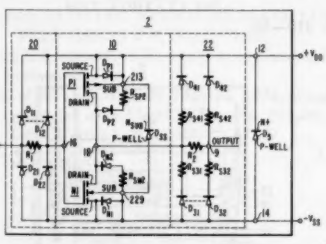
terminal means coupled to said emitter and said collector regions of said bipolar transistor.

4,066,918

PROTECTION CIRCUITRY FOR INSULATED-GATE FIELD-EFFECT TRANSISTOR (IGFET) CIRCUITS

Robert Charles Heuner, Bound Brook; Michael Barnett Goldman, Belle Mead; Stanley Joseph Niemiec, Somerville, and George Ira Morton, Belle Mead, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sept. 30, 1976, Ser. No. 728,223
Int. Cl.[2] H03K *17/00*
U.S. Cl. 307—304 **8 Claims**



1. In combination with an insulated-gate field-effect transistor (IGFET) circuit having an input node, having an output node to which the drain of an IGFET is connected, and having first and second power terminals between which are coupled the source-to-drain path of an IGFET, a protection circuit comprising:

an input terminal and an output terminal;

means connecting said input node to said input terminal;

means connecting said output node to said output terminal;

first, second, third, fourth and fifth diodes extrinsic to said IGFETs, each of said diodes having an anode and a cathode and each having a forward voltage drop (V_F) when conducting current in the forward direction and having a reverse breakdown voltage drop (V_R) when conducting current in the reverse direction which is significantly greater than its V_F, and wherein the V_F and the V_R of said fifth diode is less than the V_F and the V_R, respectively, of the first, second, third or fourth diode for the same value of current therethrough;

means connecting the anode of said first diode and the cathode of said second diode to said input terminal;

means connecting the anode of said third diode and the cathode of said fourth diode to said output terminal;

means connecting the cathodes of said first and third diodes to said first power terminal;

means connecting the anodes of said second and fourth diodes to said second power terminal; and

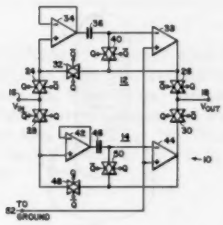
means connecting the cathode of said fifth diode to said first terminal and its anode to said second terminal.

4,066,919

SAMPLE AND HOLD CIRCUIT

Robert Charles Huntington, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 1, 1976, Ser. No. 672,682
Int. Cl.[2] G11C *27/02*
U.S. Cl. 307—353 **8 Claims**



1. A circuit for tracking magnitude of a time varying input signal and for producing upon command an output signal for a predetermined time having a magnitude which corresponds to an instantaneous value of the magnitude of the time varying input signal at the time of command, the circuit having at least an input terminal and an output terminal, comprising: means for supplying control signals; a first amplifier connected as a voltage follower and having an input and an output; first switching means responsive to the control signals, the first switching means being coupled from the input terminal to the input of the first amplifier; a second amplifier having an output, an inverting and a non-inverting input; first means for storing a voltage and being coupled from the output of the first amplifier to the inverting input of the second amplifier; second switching means responsive to the control signals and being coupled from the inverting input of the second amplifier to the output of the second amplifier; third switching means responsive to the control signals and being coupled from the input of the first amplifier to the output of the second amplifier; fourth switching means responsive to the control signals and being coupled from the output of the second amplifier to the output terminal of the circuit, a third amplifier connected as a voltage follower and having an input and an output; fifth switching means responsive to the control signals, the fifth switching means being coupled from the input terminal of the circuit to the input of the third amplifier; a fourth amplifier having an output, an inverting, and a non-inverting input; second means for storing a voltage and being coupled from the output of the third amplifier to the inverting input of the fourth amplifier; sixth switching means responsive to the control signals and being coupled from the inverting input of the fourth amplifier to the output of the fourth amplifier; seventh switching means responsive to the control signals and being coupled from the input of the third amplifier to the output of the fourth amplifier; and eight switching means responsive to the control signal and being coupled from the output of the fourth amplifier to the output terminal of the circuit, the means for supplying control signals controlling all the switching means to allow the first amplifier to be switched to the input terminal and simultaneously switching the fourth amplifier to the output terminal and then to allow the second amplifier to be switched to the

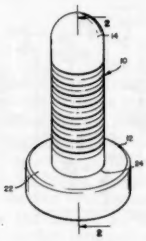
output terminal while simultaneously switching the third amplifier to the input terminal so that as the amplifiers are switched to the input terminal an input signal can be sampled and self compensation for offset voltage and common mode rejection is provided thereby eliminating manual accuracy adjustment requirements.

4,066,920

ELECTROSTATICALLY CHARGEABLE DEVICE

Paul L. Rodriguez, 2116 Center St., Garden City, Kans. 66030, and William A. Rhodes, 4421 N. 13th Place, Phoenix, Ariz. 85014

Filed June 28, 1976, Ser. No. 700,459
Int. Cl.² H02N 1/04
U.S. Cl. 310—310 **11 Claims**



1. An electrostatically chargeable device consisting of a body; said body being an elongate, generally cylindrical shape and made of electrostatically chargeable material; said body having first and second opposite ends; said first end adapted to be rubbed on a fibrous material for electrostatically charging the same; said body having a longitudinal axis and having a series of endless parallel peripheral grooves and lands disposed at an angle to said longitudinal axis thereby affording a relatively great surface dimension between said first and second ends as compared to the overall length of said body.

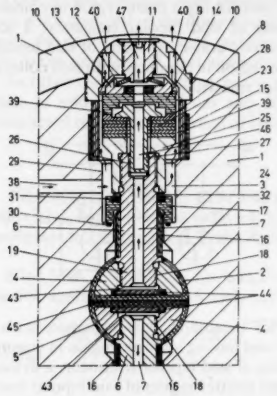
4,066,921

EXCITER-CURRENT LEAD-THROUGH BOLT INTERCONNECTING ROTOR SHAFT-ENCLOSED LEAD-IN CONDUCTOR BAR AND TERMINAL CONDUCTOR BAR LEADING TO ROTOR WINDING

Karl Blank, Mannheim, Germany, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Apr. 5, 1976, Ser. No. 673,944
Claims priority, application Switzerland, Apr. 8, 1975, 4424/75
Int. Cl.² H02K 9/00
U.S. Cl. 310—61 **11 Claims**

1. The combination with a rotor shaft of a dynamo-electric machine including a longitudinal bore containing an insulated exciter-current lead-in conductor bar and a radial bore extending from said longitudinal bore to the surface of the shaft, of an exciter-current lead-through bolt mounted in said radial bore, means securing the radially inner end of said lead-through bolt to said lead-in conductor bar, means securing an intermediate part of said lead-through bolt to a coductor member leading to an exciter winding located on said rotor, and means for applying a radially inwardly directed resilient force to the radially outer end of said lead-through bolt which comprises a locking component in the form of a cap nut secured to the outer end portion of said radial bore, said cap nut including means adjustable longitudinally of said lead-through bolt and which exerts a radially inwardly directed resilient pressure against the end



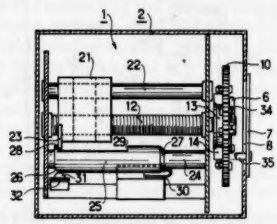
of said lead-through bolt by means including a spring member interposed therebetween.

4,066,922

ELECTRICAL MOTOR-CONTROL DEVICE FOR ELECTRICAL EQUIPMENT

Jean Hennemann, Hombliéres, and Bernard Daussin, St. Quentin, both of France, assignors to Unelec S.A., Paris Cedex, France

Filed July 22, 1976, Ser. No. 707,665
Claims priority, application France, July 28, 1975, 75.23524; Apr. 14, 1976, 76.10973
Int. Cl.² H02K 7/06
U.S. Cl. 310—80 **4 Claims**



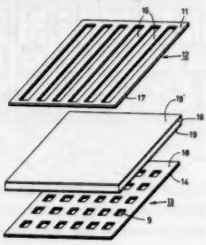
1. An electric motor-control device for electrical equipment having drive means including: electric motor means connected through a torque limiter for driving a movement transformation mechanism provided with a worm screw; a nut unit mounted on said worm screw and movable along said worm screw, said nut unit being connectable to an operating member of the electrical equipment to be controlled; said torque limiter being defined by an elastic connection between two rotating members, one connected to said drive means and the other to said movement transformation mechanism; and an accentric cam; said cam rotating with said worm screw and a drive member bearing against said cam, said cam being spring-mounted on a driven gear of said drive means, whereby said gear rotates freely about an axis common to said cam and said worm screw.

4,066,923

COLOR SELECTION LENS ELECTRODES CONNECTED BY DIFFUSION BONDS

Johannes van Esdonk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 13, 1977, Ser. No. 759,111
Claims priority, application Netherlands, Jan. 16, 1976, 7600419
Int. Cl.[2] H01J *29/07, 19/30*
U.S. Cl. 313—402 7 Claims



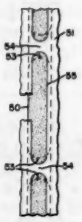
1. A colour display tube comprising in an evacuated envelope means to generate a number of electron beams, a display screen comprising a large number of regions luminescing in different colours, and colour selection means comprising a large number of apertures which assign each electron beam to luminescent regions of one colour, which colour selection means comprise a first and a second system of lens electrodes, a lens electrode belonging to the first system being electrically insulated from a lens electrode belonging to the second system by means of an insulating member, characterized in that the insulating member consists of a member which is metallized on two-sides of which one metallized side is connected to a lens electrode belonging to the first system by means of a diffusion bond and a lens electrode belonging to the second system is present on the other metallized side of the insulating member.

4,066,924

SCREEN FOR SLOTTED APERTURE MASK COLOR TELEVISION PICTURE TUBE

Wilfred Rublack, Liverpool, N.Y., assignor to General Electric Company, Portsmouth, Va.

Continuation of Ser. No. 472,349, May 22, 1974, abandoned. This application July 11, 1975, Ser. No. 595,260
Int. Cl.[2] H01J *29/28, 29/32, 31/20*
U.S. Cl. 313—408 3 Claims



1. In a cathode ray tube including a faceplate and a shadow mask containing an array of vertically oriented slotted apertures for restricting electron beams directed therethrough to impinge upon and excite selected areas of phosphor material on said faceplate, a viewing screen comprising:

a horizontally repetitive pattern of sets of three vertically oriented stripes of phosphor material extending vertically across and coating the inside surface of said faceplate, each stripe within a set being of different phosphor material so as to emit a different color when excited by the corresponding one of the three electron beams passing through the associated aperture in said shadow mask, and

a layer of light absorbing material coating the inside surface of said faceplate and containing a vertical and horizontal array of vertically oriented slotted openings, said stripes and openings being juxtaposed so that said openings define viewable portions of said stripes, each viewable portion being totally surrounded with light absorbing material,

said openings and stripes being aligned with the apertures in said shadow mask so that a corresponding one of said three electron beams is allowed to impinge upon each viewable portion,

the vertical dimension of each opening being greater than the vertical dimension of that part of said viewable portion excited by the electron beam impinging thereupon, such that a positive vertical guardband is provided, and

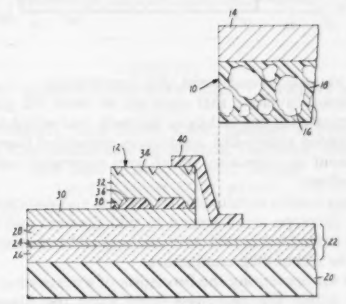
the horizontal dimension of each opening being less than the horizontal dimension of the impinging electron beam, such that a negative horizontal guardband is provided.

4,066,925

ELECTROLUMINESCENT LAMP AND ELECTRODE PREFORM FOR USE THEREWITH

Arthur D. Dickson, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 3, 1976, Ser. No. 711,356
Int. Cl.[2] H05B *33/06, 33/26*
U.S. Cl. 313—503 11 Claims



1. A substantially continuous preform adapted to be wound upon itself in roll form for use in forming an electroluminescent device comprising

a web of transparent polymeric material,

a substantially transparent electrically conducting thin-film layer extending over and secured coextensively to one surface of the web,

a continuous electrically conductive metal film in intimate contact with and extending the length of a narrow portion of the thin-film layer, the conductive film exhibiting a surface resistivity not greater than one ohm per square, and

electrical contact means adhesively secured to and extending the length of the conductive film such that an electrical potential applied to the contact means is distributed through the conductive film and substantially uniformly distributed throughout the transparent thin-film layer.

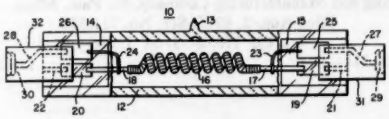
6. In a flexible electroluminescent device comprising a light transmitting flexible resin body having opposing faces and finely divided electroluminescent phosphor particles embedded therein sandwiched between and bonded to electrically conducting electrode layers, one of which electrode layers is substantially transparent, the improvement wherein the substantially transparent electrode layer comprises a transparent polymeric substrate, a substantially transparent electrically conducting thin-film layer extending over and secured coex-

tensively to one surface of the substrate, and a continuous electrically conductive metallic film in intimate contact with and extending the length of a narrow portion of the thin-film layer, the conductive film exhibiting a surface resistivity not greater than one ohm per square, and where the device further includes an electrically conducting means adhesively secured to and extending along said substantial length in an electrically conducting relationship to the conductive film, and a layer of electrically insulating tape adhesively secured between an exposed surface of the electrically conducting means and the surface of the resin body which is elsewhere bonded to the thin-film layer to uniformly distribute an electrical potential applied to the electrically conducting means through the conductiive film and substantially uniformly throughout the transparent thin-film layer, while insulating said potential from the electrode layer on the opposite side of the resin body.

4,066,926
GAS-FILLED INCANDESCENT LAMP WITH INTEGRAL FUSE ASSEMBLY

Ralph E. Newton, Dover, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 12, 1976, Ser. No. 731,393
Int. Cl.[2] H01J *7/44, 13/46, 17/34, 19/78*
U.S. Cl. 315—73 **10 Claims**



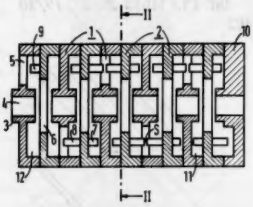
1. An electric incandescent lamp comprising;
a vitreous envelope that contains an inert fill gas and is terminated at one end by an hermetic seal which has a pair of spaced ribbon-like conductors embedded therein,
a filament or refractory metal wire suspended within said envelope,
an inner lead-in conductor having one end disposed within the envelope and fastened to said filament and its other end embedded in said hermetic seal and connected to one of the ribbon-like conductors,
means for preventing the formation of a destructive electric arc within the energized lamp when the filament fails comprising a non-coiled member of fusible metal that has one end electrically connected to a non-embedded part of said inner lead-in conductor which is located within said envelope and its opposite end embedded in the hermetic seal and fastened to the other of said ribbon-like conductors, and
external connector means comprising an outer lead-in conductor that protrudes from said hermetic seal and has an end segment which is embedded in said hermetic seal and is electrically connected to the ribbon-like conductor which is fastened to said fusible metal member,
said hermetic seal having an additional conductor member embedded therein which extends from an exposed surface of the hermetic seal toward and is secured to the ribbon-like conductor that is fastened to the inner lead-in conductor.

4,066,927
WIDE-BAND LOW-REFLECTION ATTENUATED DELAY LINE

Franz Gross, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed June 8, 1976, Ser. No. 693,840
Claims priority, application Germany, June 10, 1975, 2525845
Int. Cl.[2] H01P *1/22;* **H01J** *25/34;* **H03F** *3/58*
U.S. Cl. 315—3.5 **12 Claims**

1. In a wide-band, low-reflection attenuated delay line for traveling wave tubes, particularly for the amplification of millimeter waves, the combination of a hollow guide forming an attenuation section having transverse walls defining respective line cells therebetween, which walls each having a central opening for the passage of the electron beam and at least one coupling slot, elongated attenuating members disposed in the respective cells with their longitudinal axes extending at least

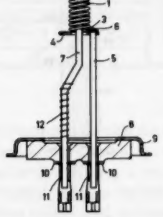


approximately parallel to the longitudinal axis of the delay line, said attenuating members having a substantially uniform effective penetration depth within the associated cells, and a line cell, forming a matching cell, disposed directly ahead of and/or behind the attenuation section for matching the latter to an adjacent section of the delay line, said matching cell, in each case, containing at least one matching member therein.

4,066,928
RESONANT CAVITY MAGNETRON HAVING A HELICAL CATHODE

Joannes Baptista Maria Adrianus Van Besouw; Egbert Bernardus Gretinus Willem Gotjé, and Franciscus Napoleon Adrianus Kerstens, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 30, 1976, Ser. No. 681,792
Claims priority, application Netherlands, May 20, 1975, 7505871
Int. Cl.[2] H01J *25/50*
U.S. Cl. 315—39.51 **3 Claims**

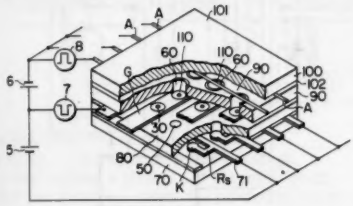


1. In a resonant cavity magnetron having a helical cathode having two ends being secured to two end plates which are supported by respective supporting rods, the improvement wherein each one of the two cathode ends is connected with a respective end plate and one of the associated supporting rods by a single collective weld, the cathode extending tangentially at its non-free end and being bent towards the axis at its free end.

4,066,929
ELECTRON-ACCELERATION TYPE FLATGAS-DISCHARGE PANEL WITH INTERNAL MEMORY FUNCTIONS AND METHOD OF DRIVING FOR SAME

Yukio Okamoto, and Masashi Mizushima, both of Hachioji, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 26, 1976, Ser. No. 652,167
Claims priority, application Japan, Jan. 24, 1975, 50-9717
Int. Cl.[2] H01J *61/04*
U.S. Cl. 315—169 TV 18 Claims



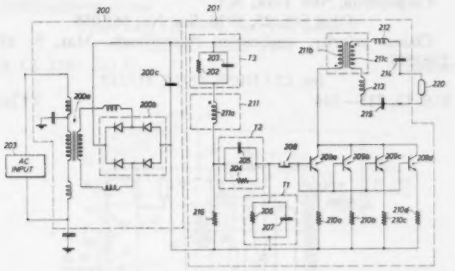
2. A flat display panel comprising:
a plurality of common cathode lines disposed in parallel on top of a first insulation sheet;
a plurality of rows and columns of cathode electrodes provided on said first insulation sheet;
a plurality of resistors disposed on said first insulation sheet, each respective resistor connecting a respective cathode electrode to a common cathode line;
a second insulation sheet defining auxiliary discharge spaces above said cathode electrodes;
a plurality of grid electrodes in sheet form disposed on top of said second insulation sheet at a predetermined angle relative to said common cathode lines, and having apertures therethrough at positions corresponding to said auxiliary discharge spaces;
a third insulation sheet having spaces therein above said apertures, a main discharge being carried out in the spaces in said third insulation sheet;
a plurality of anode electrodes disposed on top of said third insulation sheet in parallel with said grid electrodes;
a transparent insulation sheet disposed on top of said anode electrodes;
gas sealed within and filling said main discharge spaces, auxiliary discharge spaces, and apertures provided in said grid electrodes; and
means for applying pulse signals to said grid and anode electrodes
so that said main discharge maintains an internal memory function due to electrons, which pass through said apertures, controlled and accelerated by a pulse signal applied to said grid and anode electrodes.

4,066,930
ENERGIZING CIRCUITS FOR FLUORESCENT LAMPS

Frank A. Summa, Staten Island, N.Y., assignor to Electrides Corporation, Staten Island, N.Y.

Continuation-in-part of Ser. No. 564,369, April 2, 1975, abandoned. This application Mar. 26, 1976, Ser. No. 669,591
Int. Cl.[2] H05B *41/29, 37/00*
U.S. Cl. 315—209 R 5 Claims

1. In a transformer-coupled oscillator circuit for generating a high frequency signal across the secondary of the transformer to energize flourescent tubes, said oscillator circuit including at least one transistor and a DC power source with first and second terminals, the improvement comprising:
a ferromagnetic pot-core transformer having first and second primary windings and a secondary winding, said second primary winding coupled between the first terminal of the DC power source and the collector of each said transistor;
a first parallel R-C circuit having one end thereof coupled to the base of each said transistor and the second end thereof coupled to the second terminal of the DC power source;
a second parallel R-C circuit having one end thereof coupled to the base of each said transistor;
a bias resistor coupled between the second ends of said first and second R-C circuits;

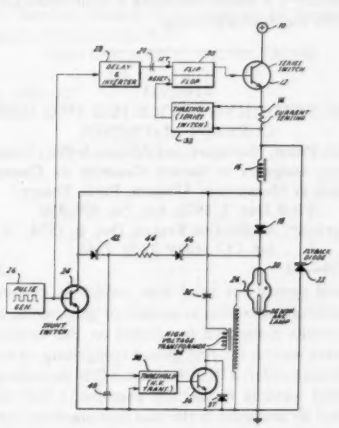


a serial combination of a third parallel R-C circuit and the first primary winding, coupled between the first terminal of the DC power source and the second end of said second R-C circuit; and
an emitter resistor coupled between the emitter of each said transistor and the second terminal of the DC power source.

4,066,931
SHUNT MODULATOR FOR HIGH CURRENT ARC LAMP

Daniel F. Morrill, Long Beach, Calif., assignor to Ford Aerospace & Communications Corporation, Dearborn, Mich.

Filed June 8, 1966, Ser. No. 556,005
Int. Cl.[2] H05B *37/02, 41/34*
U.S. Cl. 315—241 R 10 Claims



1. In combination:
a. a circuit comprising the following elements connected in series: a potential source, a series switch, an inductor, and a load impedance,
b. a shunt switch connected across said load impedance,
c. means for rendering said shunt switch alternately conductive and nonconductive,
d. means for rendering said series switch conductive when said shunt switch is rendered nonconductive, and

e. means for rendering said series switch nonconductive when the current in said inductor exceeds a predetermined value.

4,066,932

SATURABLE REACTOR DEVICE FOR OPERATING A DISCHARGE LAMP

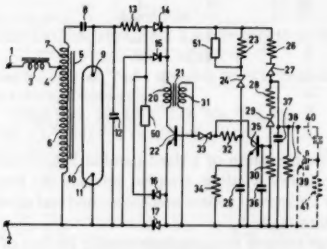
Jacob Rottier, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 25, 1976, Ser. No. 661,055

Claims priority, application Netherlands, Mar. 5, 1975, 7502577

Int. Cl.[2] H05B *41/16, 41/232*

U.S. Cl. 315—244 **9 Claims**



1. A device for starting and operating a low pressure sodium vapor discharge lamp comprising, two input terminals for connection to a source of AC voltage, first and second inductor coils, means connecting said first and second coils in a series circuit across said two input terminals, a capacitor, means connecting said discharge lamp and the capacitor in a series circuit across two terminals of the second coil, said first and second coils being designed so that the first coil does not saturate in the operating condition of the lamp, whereas the second coil does saturate during operation of the lamp, and means connecting a starter including a semiconductor switch in shunt with the discharge lamp.

4,066,933

STATIC SWITCHING DEVICE FOR TWO DIRECT CURRENT MACHINES

Quang Minh Pham, Elancourt, and Jacques Soffer, Sceaux, both of France, assignors to Societe Generale de Constructions Electriques et Mecaniques Alsthom, Paris, France

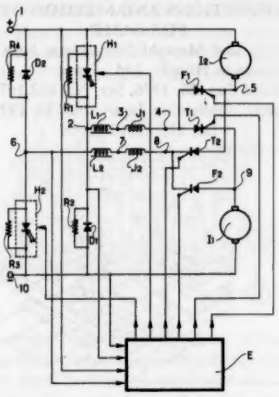
Filed Dec. 2, 1975, Ser. No. 636,950

Claims priority, application France, Dec. 5, 1974, 74.39838

Int. Cl.[2] H02P *3/00, 7/68*

U.S. Cl. 318—60 **3 Claims**

1. Control system for solid state switching of two direct current machines operating as motors or generators, comprising two circuits connected in parallel on the terminals of a direct current source, the first circuit comprising, in series and in the following order, a first chopper, a first smoothing inductance, a field winding in the first machine, a first switching thyristor and an armature in the said first machine, the second circuit comprising, in series and in the following order, an armature in the second machine, a second switching thyristor, a field winding in the second machine, a second smoothing inductance and a second chopper, first and second connections for connecting the two circuits together, the first connection connecting the anodes of said first and second switching thyristors, the second connection connecting the cathodes of said first and second switching thyristors, the first connection comprising a third switching thyristor, the second connection comprising a fourth switching thyristor, the system comprising an electronic control unit transmitting control pulses to the triggers of said switching thyristors and to those of said first



and second choppers for operating the machines as motors or generators.

4,066,934

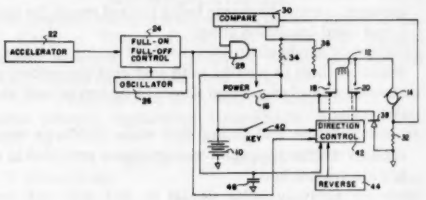
MOTOR SPEED CONTROLLER

Lindsey E. Waldorf, and Kenneth E. Monroe, both of Ann Arbor, Mich., assignors to Lindsey E. Waldorf, Ann Arbor, Mich.

Filed Apr. 23, 1975, Ser. No. 570,628

Int. Cl.[2] H02P *5/00*

U.S. Cl. 318—139 **5 Claims**

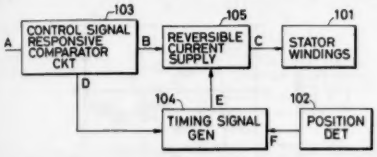


1. A system for controlling the electrical power applied to a DC drive motor for an electric vehicle, comprising: an operator controlled accelerator operative to provide an output electrical signal proportional to the accelerator position which is continuously variable between limiting values; a multi-vibrator having the output of the accelerator as its input and being operative to provide a periodically cycling bi-stable output wherein the ratio of on-time to off-time is a function of the signal received from the accelerator; a power switching device connected in series with the motor and battery; means for deriving an electrical signal having a value which is a direct function of the instantaneous current passing through the motor; comparator means operative to receive said instantaneous current signal and a reference value and to provide an output signal at such time as the current passing through the motor exceeds the reference value; and a gate for controlling said switching device, to pass current from the battery to the motor only and at all times when the output of the multi-vibrator is in an "on" state and a signal representative of the instantaneous value of the current passing through the motor does not exceed said reference signal.

4,066,935
STATOR WINDING CONTROL CIRCUIT FOR A BRUSHLESS D.C. MOTOR

Saburo Takaoka, and Norikazu Fujie, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sept. 30, 1976, Ser. No. 728,325
Claims priority, application Japan, Oct. 2, 1975, 50-119272
Int. Cl.[2] H02K *29/00*
U.S. Cl. 318—138 **7 Claims**

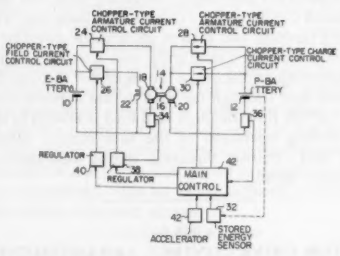


1. A brushless d.c. motor, comprising:
a. a stator including multi-phase windings,
b. a rotor having a plurality of magnetic poles,
c. position detecting means for producing output signals in response to the positional relationship between said stator and said rotor,
d. means including a comparator for producing a first output signal in response to the absolute value of an input control signal and a second output signal in response to the polarity of said input control signal,
e. means for producing a plurality of timing signals having a phase sequence in accordance with the polarity of said second output signal and timed in accordance with the output signals from said position detection means, and
f. means for sequentially driving said multi-phase stator windings with currents having magnitudes proportional to the absolute value of said first output signal and a phase sequence corresponding to that of said timing signals, whereby reversible torques may be produced in said motor.

4,066,936
HYBRID BATTERY ELECTRIC DRIVE

Toshio Hirota, No. 3-5-20, Nakahara, Isogo, Yokohama, Japan

Filed May 30, 1975, Ser. No. 582,359
Claims priority, application Japan, June 10, 1974, 49-65029
Int. Cl.[2] H02P *5/00*
U.S. Cl. 318—139 **2 Claims**

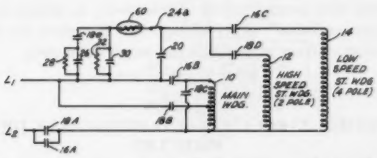


1. In a hybrid battery electric drive: a motor having a first armature coil, a second armature coil mechanically connected to said first armature coil for simultaneous rotation and insulated from said first armature coil and a field coil common to said first and second armature coils;
a first battery having a high specific energy, said first battery being electrically connectable in use with said first armature coil and said field coil;
a second battery having a specific power, said second battery being electrically connectable in use with said second armature coil; and
means for alternatively connecting in dependence upon the load on the motor said first battery to said first armature and to said first coil and second battery to said second armature coil.

4,066,937
CONTROL CIRCUIT FOR A TWO SPEED SINGLE PHASE MOTOR

David M. Pfarrer, Hurst, and Leonard J. Van Essen, Fort Worth, both of Tex., assignors to Lennox Industries, Inc., Marshalltown, Iowa

Filed Jan. 13, 1976, Ser. No. 648,622
Int. Cl.[2] H02P *1/44*
U.S. Cl. 318—221 G **7 Claims**

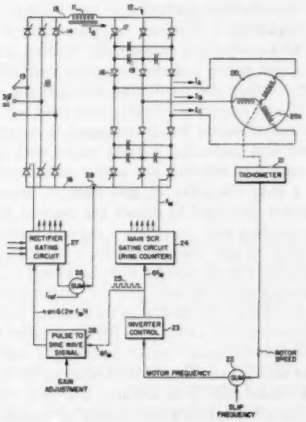


1. For use with a single-phase two-speed motor comprising a main winding, a start winding means including a low speed start winding and a high speed start winding in circuit with the main winding and adapted to provide either a high speed operation or low speed operation, low-speed contactor means, high speed contactor means, start relay means, start capacitor means and run capacitor means, a thermistor in series with the start contacts of the start relay means for preventing welding of the start contacts of the start relay means, the start capacitor means being in parallel with the run capacitor means and the thermistor and start contacts are electrically disposed between the start capacitor means and the run capacitor means.

4,066,938
INPUT CURRENT MODULATION TO REDUCE TORQUE PULSATIONS IN CONTROLLED CURRENT INVERTER DRIVES

Fred G. Turnbull, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 6, 1976, Ser. No. 730,145
Int. Cl.[2] H02P *5/40*
U.S. Cl. 318—227 **6 Claims**



1. A controlled current motor drive system comprising
a voltage converter and a polyphase current source bridge inverter connected in cascade with a direct current reac-

tor therebetween for producing variable amplitude and frequency output current to be supplied to a motor,

first control means for operating said voltage converter to produce variable output voltage and thereby determine the magnitude of the undirectional input current fed to said inverter, and second control means for determining the operating frequency of said inverter and therefore the motor frequency,

said second control means including means for deriving a desired motor frequency signal and means for generating an inverter gating circuit signal having a frequency equal to six times the motor frequency, and

torque pulsation reduction control means for utilizing said inverter gating circuit signal to derive a sixth harmonic modulating signal which is used as an additional input to said first control means to selectively modulate the voltage converter output voltage and therefore the inverter input current at six times the motor frequency.

4,066,939
CONTROL CIRCUITS FOR ELECTRICALLY DRIVEN VEHICLES

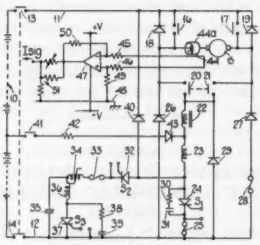
John Frank Joyes, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Feb. 26, 1976, Ser. No. 661,497

Claims priority, application United Kingdom, Feb. 28, 1975, 8349/75

Int. Cl.[2] H02P *3/12*

U.S. Cl. 318—251 **2 Claims**



1. A control circuit for an electrically driven vehicle having a series field D. C. motor having a motor field winding and a motor armature winding and also having a traction battery having a low voltage portion and low voltage tapping, said circuit comprising a thyristor current control circuit connected in series with said motor field winding, switch devices connecting said motor armature winding with said field winding and the battery and providing forward and reverse drive modes with said armature winding, said field winding and said current control circuit being arranged in series across said battery and also providing a brake mode with said armature winding, said field winding and said current control circuit in series in a loop exclusive of said battery, armature current sensing means arranged to detect the current flowing in the armature winding and providing a current feedback signal to said thyristor current control circuit, a switch control circuit controlling said switch devices and connected to said armature current sensing means so as to prevent operation of said switch devices to connect the motor in its braking mode while the armature current is in excess of a predetermined value, a relay having a normally open contact connecting said low voltage tapping on said battery to said field winding so that when said contact is closed said field winding and said current control circuit are in series across a low-voltage portion of said battery, and relay operating means controlled by said armature current sensing means and arranged to close said relay contact whenever the braking mode is selected and the armature current is below said predetermined level.

4,066,940
ELECTRICAL CONTROL APPARATUS

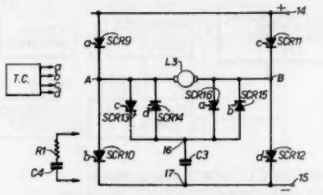
Ian Henderson, Edgefield, High St., Medstead, Alton, England

Continuation of Ser. No. 412,357, Nov. 2, 1973, which is a continuation-in-part of Ser. No. 273,293, July 19, 1972, Pat. No. 3,780,366. This application Oct. 6, 1975, Ser. No. 620,233

Claims priority, application United Kingdom, Sept. 9, 1971, 42132/71

Int. Cl.[2] H02P *7/00*

U.S. Cl. 318—294 **1 Claim**



1. Control apparatus for selectively supplying either always positive or always negative current to a load from a DC supply comprising first and second terminals for connection to said supply, a first thyristor, a second thyristor connected in series with the first thyristor, a fourth thyristor connected in series with said third thyristor between said first and second terminals, a load connected between the junction of the first and second thyristors and the junction of the third and fourth thyristors, a capacitor having first and second electrodes, said first electrode being connected to said second terminal, a fifth thyristor connected in one polarity between the junction of the first and second thyristors and the second electrode of said capacitor a sixth thyristor connected in parallel with said fifth thyristor, but in opposite polarity thereto, a seventh thyristor connected in one polarity between the junction of said third and fourth thyristors and the second electrode of said capacitor, and an eighth thyristor in parallel with the seventh thyristor but in opposite polarity thereto; first control means adapted to be connected to said first, seventh, eighth, and second thyristors for alternately rendering both said first and seventh thyristors conducting to charge the capacitor with current flowing through said load in a first direction, and then rendering both said eighth and second thyristors conducting to discharge the capacitor through the load with current flow through the load in said first direction; and second control means adapted to be connected to said third, fifth, sixth, and fourth thyristors for alternately rendering both said third and fifth thyristors conducting to charge said capacitor with current flowing through said load in an opposite direction to said first direction, and then rendering said sixth and fourth thyristors conducting to discharge the capacitor through the load with current flow through the load in said opposite direction; whereby, current flow through said load is always in said first direction during operation of the first control means, and always in said opposite direction during operation of said second control means.

4,066,941
MOTOR DRIVE CONTROL ARRANGEMENTS

Alan Foster, Hitchin, England, assignor to International Computers Limited, London, England

Filed Apr. 11, 1975, Ser. No. 567,197

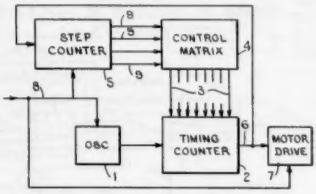
Claims priority, application United Kingdom, Apr. 11, 1974, 16249/74

Int. Cl.[2] H02P *5/16*

U.S. Cl. 318—341 **8 Claims**

1. A motor drive control arranged to control the speed of a motor in accordance with a predetermined velocity variation curve including: a memory device including a plurality of addressable storage locations respectively containing different stored values relating to required increments of movement of the motor; a step counter operable to address the storage loca-

tions of the memory device, the location addressed being determined by the contents of the step counter; means operative to increment the step counter for each incremental movement of the motor to read out the values from the memory



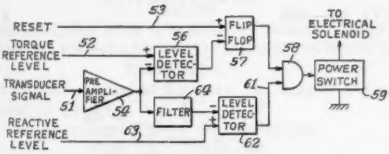
device relating respectively to the required increments of movement of the motor; and drive means responsive to the values read out from the memory device to supply drive current to the motor so as to cause the motor to move in accordance with the predetermined velocity variation curve.

4,066,942

CONTROL CIRCUIT FOR A POWER TOOL

Francis G. Bardwell, Elmhurst, and Edmund C. Dudek, St. Charles, both of Ill., assignors to Thor Power Tool Company, Aurora, Ill.

Division of Ser. No. 418,762, Nov. 23, 1973, Pat. No. 3,926,264.
This application Oct. 10, 1975, Ser. No. 621,485
Int. Cl.[2] H02K *17/32, 23/68, 27/30*
U.S. Cl. 318—434 **13 Claims**



1. A control circuit for use in a torque applying tool including a motor connected to turn a power output shaft of the tool and switch means connected to control energization of the motor, said control circuit comprising torque output level sensing means adapted to be coupled to said output shaft for generating a torque signal which is a function of the output torque, means providing a predetermined reaction torque reference signal, first comparing means for said torque signal and said reaction torque reference signal, said switch means being responsive to said comparing means to repeatedly energize and deenergize the motor, means providing a maximum torque reference signal above said reaction torque reference signal and second comparing means for said maximum torque reference signal and said torque signal to deenergize said motor when a preselected relation exists between said torque and reaction torque reference signals.

4,066,943

HIGH SPEED PRECISION CHUCK ASSEMBLY

Jacques L. Roch, San Jose, Calif., assignor to Electroglas, Inc., Menlo Park, Calif.

Division of Ser. No. 448,370, March 5, 1974, Pat. No. 3,936,743.
This application Nov. 10, 1975, Ser. No. 630,662
Int. Cl.[2] H01H *3/02*
U.S. Cl. 318—468 **15 Claims**

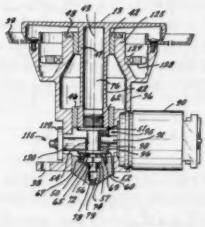
1. In a system for reciprocally moving a work table in a vertical direction along a particular axis while providing for rotation thereof about said axis comprising:

a chuck housing including a bore, the bore being disposed in alignment with said axis,

a chuck plate provided for supporting the work table and mounted for sliding movement vertically within said bore and in axial alignment with said axis,

spool means including spaced flanges mounted at one end of said chuck plate for providing a vertical movement of said chuck plate and for providing a rotation of said chuck plates with respect to said particular axis,

said chuck plate being perpendicular to said axis whereby rotation of said spool maintains said chuck plate in a plane perpendicular to said axis,



bearing means mounted between said spaced flange means for providing for a rotation of said spool means,

switching means associated with the spool means for indicating when the chuck plate has moved vertically through a particular distance, and

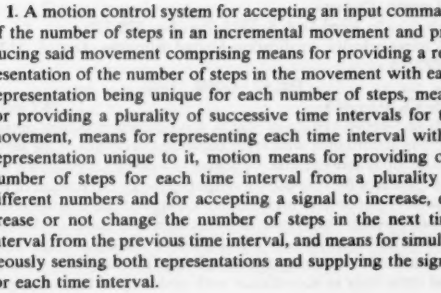
means cooperative with said switching means to provide a controlled vertical movement of the chuck plate through the particular distance.

4,066,944

MOTION CONTROL SYSTEM WITH INCREMENTAL DATA COMMANDS

Aibert C. Leenhouts, Harwinton, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed May 6, 1976, Ser. No. 683,883
Int. Cl.[2] G05B *19/28*
U.S. Cl. 318—571 **11 Claims**

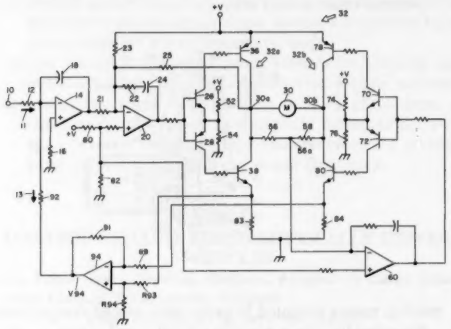


1. A motion control system for accepting an input command of the number of steps in an incremental movement and producing said movement comprising means for providing a representation of the number of steps in the movement with each representation being unique for each number of steps, means for providing a plurality of successive time intervals for the movement, means for representing each time interval with a representation unique to it, motion means for providing one number of steps for each time interval from a plurality of different numbers and for accepting a signal to increase, decrease or not change the number of steps in the next time interval from the previous time interval, and means for simultaneously sensing both representations and supplying the signal for each time interval.

4,066,945
LINEAR DRIVING CIRCUIT FOR A D.C. MOTOR WITH CURRENT FEEDBACK

Donald R. Korte, Jr., Pompano Beach, Fla., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 31, 1976, Ser. No. 672,106
Int. Cl.[2] G05F *1/08*
U.S. Cl. 318—681 **6 Claims**



1. A circuit for driving an electrical motor in response to a command signal comprising:

a voltage source;

a bridge circuit connected across said voltage source, said motor being connected between interior points of said bridge circuit, said bridge circuit including a first side comprising first and second controllable power transmission means and a second side comprising third and fourth controllable power transmission means;

a voltage divider connected across said motor;

first feedback means for generating a feedback signal related to the current flow through said motor;

means for combining said feedback signal with said command signal to produce a control signal;

first control means responsive to said control signal for controlling said first and second power transmission means;

second feedback means connected between said bridge circuit and said first control means for controlling the voltage on one of the terminals of said motor; and,

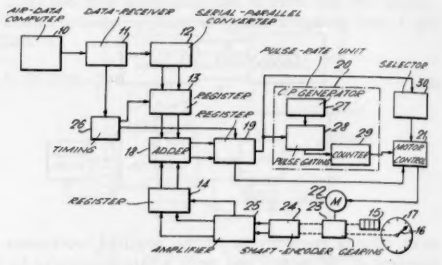
second control means responsive to the voltage at an interior point of said voltage divider for controlling said third and fourth power transmission means, wherein said first and second control means comprise first and second operational amplifiers respectively referenced to the same voltage whereby the quiescent voltage difference across said motor is zero.

4,066,946
SERVO SYSTEMS

John W. D. Jones, Stonehouse, and Keith R. Oakey, Cheltenham, both of England, assignors to Smiths Industries Limited, London, England

Filed Dec. 5, 1975, Ser. No. 638,222
Claims priority, application United Kingdom, Dec. 6, 1974, 52927/74
Int. Cl.[2] G05B *19/40*
U.S. Cl. 318—685 **14 Claims**

1. In a servo system in which drive means provides output drive in accordance with error between the output of the servo and an input demand that is updated in value intermittently, the improvement for minimizing output-velocity fluctuation of the system in response to high-rates of change of the input-demand value, wherein the system includes means to staticize the said error in the intervals between successive updatings of the input demand, said staticizing means updating the staticized value of said error only in accordance with updating of the said input-demand value, and wherein said drive means is coupled to said staticizing means to respond to the error-values staticized in respect of successive updatings of said input demand, said

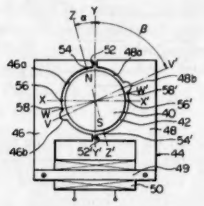


drive means responding to each such staticized error-value to drive the said output in accordance with the staticized error-value at a substantially constant rate throughout until the next updating of said error value.

4,066,947
STEPPING MOTOR FOR ELECTRONIC TIMEPIECE

Fumio Nakajima, Tokyo; Takayasu Machida, Iruma, and Kenji Yamada, Koganei, all of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Jan. 7, 1976, Ser. No. 647,282
Claims priority, application Japan, Sept. 25, 1975, 50-114897
Int. Cl.[2] H02K *37/00*
U.S. Cl. 318—696 **6 Claims**



1. A reversible stepping motor comprising:

stator pole pieces having inwardly rounded peripheries and spaced from each other by air gaps, said stator pole pieces having indentations formed on said rounded peripheries on an axis angled at substantially 60° with respect to a center line of said air gaps, respectively, to provide an axis of static equilibrium at an angle of substantially 30° with respect to said center line of said air gaps, and said stator pole pieces being magnetically connected to each other by a magnetically conductive member on which a driving coil is wound;

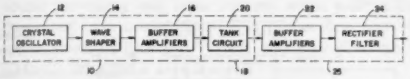
a permanent magnet rotor rotatably mounted in a space defined between said rounded peripheries of said stator pole pieces and having a pair of North and South poles in a radial direction; and

a driver circuit connected to said driving coil and including gate means connected to a source of clock pulses to alternately apply two-phase pulses to said driving coil to alternately energize said stator pole pieces in North and South polarities for thereby causing said rotor to rotate in a normal direction, and circuit means connected to switch means and responsive to a switching signal delivered therefrom to cause said gate means to change the order of supply of said two-phase pulses being applied to said driving coil within a predetermined time interval for thereby permitting the reverse rotation of said rotor.

4,066,948
CONCENTRATION MEASURING APPARATUS AND PROCESS

Roger M. Hawk, Mentor, and Thomas A. Mitchell, Painesville, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Nov. 20, 1975, Ser. No. 633,954
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—30 R 21 Claims



1. A concentration measuring apparatus comprising:

a means for generating a monochromatic alternating wave having a known power;

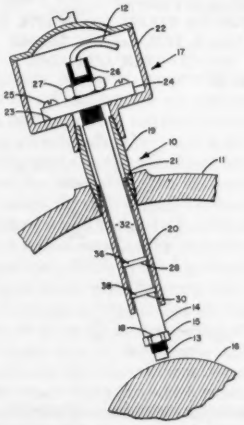
means for passing the wave through a liquid solution operatively connected to the means for generating; the means for generating including an electrode located in the solution for tranmission of the wave into the solution; the solution absorbing some of the power of the wave in an amount which is dependent on the concentration of the solution;

means for measuring an indication of the power of the alternating wave after passing through the solution operatively connected to the means for passing in order to determine the difference between the power of the wave before it is passed through the solution and after and thus determine the amount of power of the wave absorbed by the solution at a known temperature.

4,066,949
PROBE HOLDER FOR A MACHINE BODY POSITION SENSOR, WITH MEANS TO INCREASE ITS NATURAL FREQUENCY

Edward J. Condrac, East McKeesport, Pa., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Sept. 2, 1976, Ser. No. 720,012
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—262 1 Claim



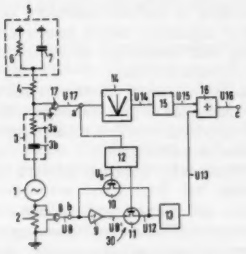
1. In an assembly for holding a sensing device operable to electrically observe the position of a body contained within a rotary machine over a defined air gap, including a mounting structure secured to the outside of the machine and having a generally elongated cylindrical housing section extending through an opening in said machine, the improvement comprising:

a removable probe holder supported in cantilevered fashion within said mounting structure, the elongated free end of said holder extending substantially coaxial within said elongated housing section and terminating in closely spaced relation to said observed body, said holder having a pair of spaced circumferentially extending grooves formed on the outer surface thereof in proximity to said free end thereof, said grooves being relatively closer to the free end of said holder than to the supported end thereof, the space between said grooves being at least three-fourths of an inch, each of said grooves having a resilient ring provided therein, with the outer surface of each of said resilient rings being in contact with the inner surface of said housing section to provide a resilient support structure for said holder within said housing said rings being designed to increase the natural frequency of the holder above the second harmonic of the maximum machine running speed.

4,066,950
CIRCUIT FOR MEASURING THE GROUND RESISTANCE OF AN UNGROUNDED POWER CIRCUIT

Gerhard Rumold, Bubenreuth, and Georg Russ, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 9, 1976, Ser. No. 721,852
Claims priority, application Germany, Sept. 25, 1975, 2542811
Int. Cl.[2] G01R *31/02, 27/08*
U.S. Cl. 324—51 5 Claims



1. A circuit arrangement for measuring the ground resistance of an ungrounded power circuit comprising:

a. a series circuit containing an ac voltage generator, a measuring resistor and a coupling member, coupled between the ungrounded power circuit and ground; and

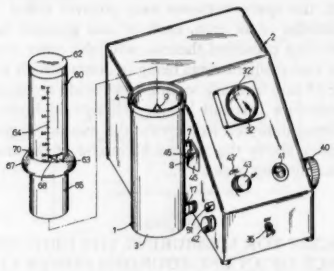
b. an evaluating circuit, having inputs coupled respectively to the point at which said series circuit is coupled to said ungrounded power circuit and across said measuring resistor to provide first and second voltage inputs proportional respectively to the voltage at said ungrounded power circuit and the current through said measuring resistor, for determining the ratio of the components of said voltage and current which are in phase with each other, said evaluating circuit comprising:

1. an absolute magnitude circuit having as its input said first measured voltage;
2. a mean forming circuit having the output of said absolute value circuit as an input;
3. a phase sensitive rectifier circuit having as its input said second measured voltage, said rectifier circuit also coupled to said first measured voltage and providing at its output the portion of said second measured voltage which is in phase therewith;
4. a second mean forming circuit having at its input the output of said phase sensitive rectifier circuit; and
5. a divider having as inputs the outputs of said first and second mean forming circuits and providing an output which is one of the ground resistance and ground conductance of the circuit being measured.

4,066,951
APPARATUS FOR CALIBRATING MOISTURE MEASURING INSTRUMENT

Robert O. Wang, 2744 S. 61st St., Milwaukee, Wis. 53219

Filed Oct. 4, 1976, Ser. No. 729,128
Int. Cl.[2] G01R *27/26*
U.S. Cl. 324—61 R 22 Claims



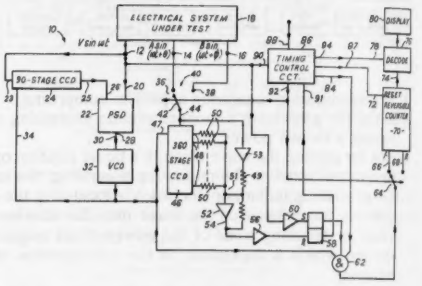
1. In combination:
an instrument for measuring the moisture content of a sample of material;
said instrument comprising a test cell including a pair of spaced apart electrodes, one of said electrodes having the form of a hollow container open at one end and the other of said electrodes being disposed within said container, a meter providing a readout indicative of said moisture content, and adjustable means selectively operable for recalibrating said instrument to ensure that said meter provides a correct readout;
and apparatus for indicating whether or not said instrument is properly calibrated so that said adjustable means may be selectively operated to effect recalibration, if necessary, said apparatus comprising:
a removable member for insertion between the electrodes of said test cell;
means between said member and at least one of said electrodes for frictionally maintaining said member inserted in a predetermined position between said electrodes;
a pointer having a predetermined position with respect to said test cell; and
scale means on said member for cooperation with said pointer to indicate the extent to which said member is inserted between said electrodes and providing a readout on said scale correlated to the readout of the meter of said instrument when said instrument is properly calibrated and facilitating adjustment of said adjustable means to effect recalibration if said readout on said scale does not correlate to said readout of said meter.

4,066,952
PHASE MEASURING APPARATUS

Anthony John Ley, New Canaan, Conn., assignor to The Solartron Electronic Group Ltd., Hampshire, England

Filed July 9, 1976, Ser. No. 703,733
Claims priority, application United Kingdom, July 12, 1975, 29386/75
Int. Cl.[2] G01R *25/00*
U.S. Cl. 324—83 D 18 Claims

1. Apparatus for measuring the phase difference between two electrical signals having the same frequency *f*, one of which is a reference signal and the other of which may be contaminated by harmonics, comprising:
circuit means responsive to the reference signal for generating clock pulses at a frequency which is a predetermined multiple of the frequency *f* of the reference signal;
a transversal filter for receiving and filtering the other signal to produce a filtered output signal, the filter comprising an N-stage charge-coupled device for receiving and sampling the other signal in combination with summing means arranged to generate the filtered output signal by receiving and summing respective weighted signals each derived from a respective stage of the charge-coupled device, the charge-coupled device being clocked in dependence upon the clock pulses at a rate equal to N times *f* and the weights of said weighted signals being selected in accordance with a predetermined function such that the transversal filter substantially reduces the harmonics in said other signal;

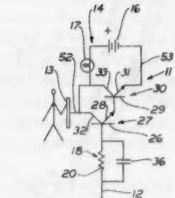


means responsive to the reference signal for generating a first timing signal at a predetermined point in each cycle thereof;
means responsive to said output signal of the transversal filter to produce a second timing signal at a point in each cycle thereof corresponding to said predetermined point; and
means for determining the number of clock pulses between said first and second timing signals, said number being representative of the phase difference between the reference signal and the other signal.

4,066,953
COMBINATION HIGH IMPEDANCE CONTINUITY AND VOLTAGE INDICATING INSTRUMENT

Charles Gold, Hallandale, Fla., assignor to Lawrence Gold, Berkeley, Calif., a part interest

Continuation of Ser. No. 512,191, Oct. 7, 1974. This application Nov. 3, 1976, Ser. No. 738,443
Int. Cl.[2] G01R *1/30, 31/02*
U.S. Cl. 324—123 R 3 Claims



1. An electric testing instrument comprising:
an amplifier circuit having a pair of input terminals comprising a probe and a second terminal adapted for manual engagement by the user for completing an input circuit through the body of the user, and an output circuit comprising in series a collector, an emitter, a battery and a current responsive indicator;
said second terminal being connected to the side of said battery connected to said collector and having a polarity opposite to said emitter;

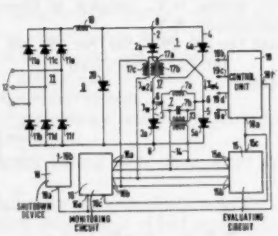
said indicator providing a manually discernible signal at and above an operating current flow in said output circuit, said amplifier having a gain of at least about 25,000 and providing said operating current flow in said output circuit when said input circuit is biased with an input current as low as about 1 microampere;

said input circuit providing said input current derived solely from said battery when said input terminals are connected across a resistance as high as at least 1 megohm, said input circuit providing said input current when said probe is connected to a conventional live power line providing approximately 110 volts AC and said second terminal is manually engaged.

4,066,954
FREQUENCY CONVERTER

Lovro Vukasovic, and Janos Raduka, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 15, 1976, Ser. No. 723,548
Claims priority, application Germany, Sept. 18, 1975, 2541701
Int. Cl.[2] H02M *1/18;* H02H *7/122*
U.S. Cl. 363—37 **10 Claims**



1. In a frequency converter comprising an inverter with thyristors in a bridge circuit, the a-c outputs of which are connected to a resonant circuit and the d-c inputs of which are connected to an a-c voltage source, via an intermediate d-c link with a smoothing choke and a controlled rectifier and having a voltage sensor for determining the resonant circuit voltage and a current sensor for determining the inverter output current, the outputs of which are inputs to evaluating circuit, the output of which is connected to the control unit for the thyristors of the inverter, which evaluating circuit determines by means of a trigger pulse, prior to every zero crossing of the resonant circuit voltage, a firing instant for thyristors of diagonal bridge arms of the inverter, the position of which depends on the commutation time of the inverter and the protection time of the thyristors, the improvement comprising:

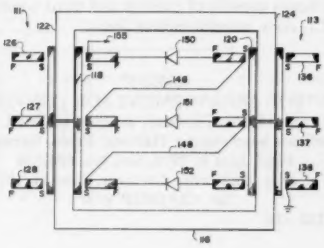
a. the current sensor being one which measures and adds up to an ac current the currents in bridge arms with a common d-c terminal; and

b. a monitoring circuit having as inputs the outputs of the current and the voltage sensor and developing at its output a pulse if, between a firing instant (t_z) and the corresponding zero crossing (t_o) of the resonant circuit voltage, the inverter output current and the resonant circuit voltage remain in phase or developing said pulse if said current and voltage are in phase opposition after the zero crossing.

4,066,955
HIGH VOLTAGE TRANSFORMER WINDING ASSEMBLY WITH MULTIPLE FREQUENCY TUNING

Charles E. Suthers, Chesapeake, Va., assignor to General Electric Company, Portsmouth, Va.

Filed Dec. 29, 1975, Ser. No. 645,012
Int. Cl.[2] H01F *35/00*
U.S. Cl. 363—68 **6 Claims**



1. In a television receiver, a transformer for providing substantially rectangular shaped high-voltage output pulses to the cathode ray tube of said television receiver in response to input pulses, said transformer comprising:

a magnetic core having at least a pair of legs,

a primary winding mounted on at least one of said legs and responsive to said input pulses to produce magnetic flux in said core,

a high voltage winding assembly comprised of first and second subassemblies of windings, each subassembly being mounted on one of the legs of said core,

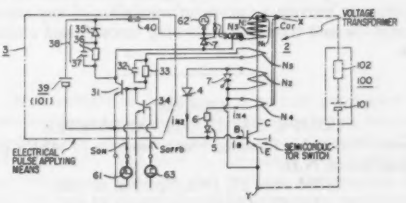
means interconnecting the windings of said first and second subassemblies to form a plurality of winding pairs, each winding pair being comprised of a winding of said first subassembly and a winding of said second subassembly, the interconnection being such that said windings are connected in series aiding relationship,

said pair of legs and the subassemblies mounted thereon being spaced from each other by a distance selected to enhance the leakage inductance to produce substantially rectangular output pulses from said high voltage winding assembly.

4,066,956
SEMICONDUCTOR SWITCH DEVICE HAVING MEANS FOR SUPPLYING CONTROL CURRENT TO A CONTROL ELECTRODE

Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed July 12, 1976, Ser. No. 704,533
Claims priority, application Japan, Sept. 12, 1975, 50-111315
Int. Cl.[2] H02M *7/537*
U.S. Cl. 363—131 **13 Claims**



1. A semiconductor switch device comprising: a semiconductor switch having at least one pair of control electrodes and at least one pair of main electrodes, the control electrodes being supplied with a control current while the semiconductor

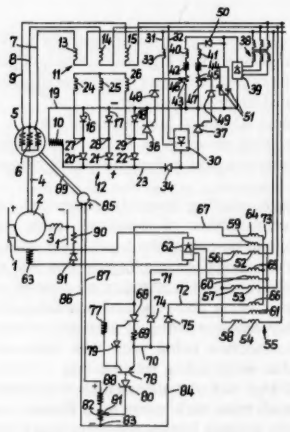
switch is maintained conductive between said main electrodes, and the main electrodes being serially inserted in a current path; and a transformer having a first conductor responding to a current passing said current path, a second winding connected to said control electrodes, a third winding producing a magnetomotive force reverse to that produced across said first conductor, and a fourth winding producing a control current to said control electrodes by induction from said third winding, the third winding being equipped with an electrical pulse applying means capable of causing said third winding to produce said reverse magnetomotive force.

4,066,957

CONTROL ARRANGEMENT FOR CONVERTER

Herbert Seeger, Essen, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed June 9, 1976, Ser. No. 694,224
Claims priority, application Germany, June 14, 1975, 2526684
Int. Cl.[2] H02P *9/04*
U.S. Cl. 322—16 **9 Claims**



1. In combination with a converter including a direct current motor having at least one exciter coil, a three-phase generator driven by said motor and having at least one exciter coil, and a circuit including a three-phase transformer, whose input is connected to the three-phase mains connected to the output of said generator, and a series connected three-phase rectifier, for feeding current to at least one of said exciter coils; a control means for controlling a selected parameter of said converter, said control means comprising in combination: at least one closed circuit including the series connection of a secondary winding of said transformer, a controlled thyristor, and two further secondary windings of said transformer which are connected in parallel with each other; and means responsive to said selected parameter for varying the control current of said thyristor to provide a two-point regulation of any saturation current for said transformer flowing through said closed circuit.

4,066,958

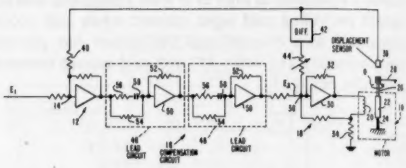
COMPENSATED GALVANOMETER

Edward Burke, Jr., Reading, Mass., assignor to MFE Corporation, Salem, N.H.

Filed June 17, 1976, Ser. No. 697,103
Int. Cl.[2] G01R *1/14*; G01D *11/10*
U.S. Cl. 324—125 **5 Claims**

1. A galvanometer of the type comprising a limited displacement motor, an output element displaced by said motor in response to an input signal applied to the galvanometer, and resilient means urging said motor to a neutral position, the galvanometer having a resonant angular frequency, ω_o, said galvanometer further comprising

A. means for essentially critically damping said motor so that the amplitude of the displacement of said output element varies with the frequency of the galvanometer input signal in essentially the same manner as the transfer function of a two-section lag circuit, and



B. a series compensation circuit

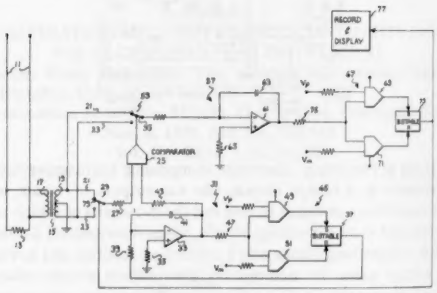
1. connected to pass the galvanometer input signal to said motor,
2. having a double-lead characteristic, and
3. having a break-point angular frequency of ω_o.

4,066,959

ELECTRONIC VOLT-SQUARE-HOUR METERING METHOD AND APPARATUS

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,398
Int. Cl.[2] G01R *21/06*
U.S. Cl. 324—141 **10 Claims**



1. An electronic meter for measuring volts-square-hours in an electrical system comprising:

means for generating first and second analog signals, said signals being proportional to a voltage in said system, and said first analog signal being 180° out-of-phase with respect to said second analog signal,

means for pulse width modulating one of said analog signals to derive a signal having a pulse width proportional to the amplitude of said analog signal,

means for multiplying said pulse width amplitude by said first and second analog signals,

means for integrating the output of said multiplying means to derive a signal proportional to volts-square-hours,

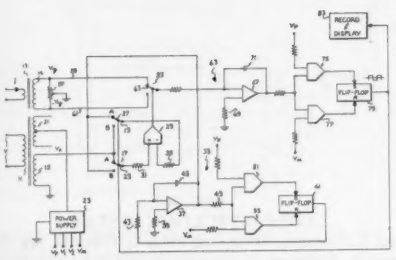
means for converting said signal proportional to volts-square-hours to a pulse train proportional to volts-square-hours, and

means for alternately coupling said first and second analog signals to said pulse width modulating means every nth time a pulse is generated by said converting means.

4,066,960
ELECTRONIC KILOWATT-HOUR-METER WITH ERROR CORRECTION

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,298
Int. Cl.[2] G01R *21/06*
U.S. Cl. 324—142 7 Claims



1. An electronic meter for measuring energy consumed in an electrical system comprising:

means for generating first and second analog signals, said signals being proportional to a current in said system, and said first analog signal being 180° out-of-phase with respect to said second analog signal,

means for generating a third analog voltage proportional to a voltage in said system,

means for generating a relatively high frequency triangular waveform signal,

a comparator having an in-phase input and an inverting input,

switching means for selectively coupling said triangular waveform to one input of said comparator and said third analog signal to the other input of said comparator, the output of said comparator being a pulse width modulated signal having a pulse width proportional to the amplitude of the third analog signal,

means for multiplying said pulse width modulated output signal of said comparator with a signal proportional to said first and second current proportional analog signals, the output of said multiplier having an amplitude proportional to the electrical current in said system and having a pulse width proportional to the amplitude of the voltage in said system,

an integrator, said integrator being connected to the output of said multiplier, the output of said integrator being proportional to the energy consumed in said system,

a pulse generator, the input of said generator being connected to said integrator to thereby convert the output of said integrator to a pulse train, each pulse being proportional to energy consumed in said system,

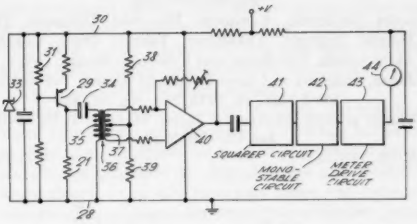
means connected to said pulse generator for recording and displaying the energy consumed in said electrical system, and

error correction means responsive to the output pulses of said generator for operating said switching means to reverse the input terminals of said comparator to which said triangular waveform signal and said third analog signal are connected to thereby correct offset integration errors in said meter.

4,066,961
SPEED SENSING

Dominic Paul Edmund Barnard, Witney, England, assignor to Smiths Industries Limited, London, England

Filed Feb. 4, 1976, Ser. No. 655,186
Claims priority, application United Kingdom, Feb. 5, 1975, 4975/75
Int. Cl.[2] G01P *3/46*
U.S. Cl. 324—163 7 Claims



1. Speed sensing apparatus for a diesel engine in which air is intermittently drawn into a combustion chamber through a hot inlet of the engine, the air being warmed by the hot inlet comprising,

a temperature-responsive device which has an electrical characteristic that varies in accordance with the temperature of the air in said hot inlet

means supporting said device in said inlet of the diesel engne,

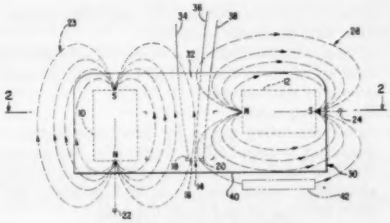
said device being of the kind which has a response time to temperature variations permitting its said electrical characteristic to vary in accordance with the cyclical variations in the temperature of the air in said hot inlet occurring upon each revolution of the engine,

and means responsive to said variation of said electrical characteristic of said device for deriving a signal indicative of engine speed.

4,066,962
METAL DETECTING DEVICE WITH MAGNETICALLY INFLUENCED HALL EFFECT SENSOR

Wolfgang Jaffe, Roselle Park, N.J., assignor to The Singer Company, New York, N.Y.

Filed Dec. 8, 1976, Ser. No. 748,434
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—208 5 Claims



1. The combination comprising a pair of permanent bar magnets and a solid state Hall effect sensor including input and output leads, the magnets and sensor being disposed in fixed spatial relationship and held in assembled relationship in a binder, the sensor being located between the magnets in a position wherein the broad plane of the sensor is parallel to an exposed surface of the binder and the magnets having their axes mutually perpendicular but parallel and perpendicular respectively with respect to said plane of the sensor in positions wherein flux from the magnets at least partially cancel-

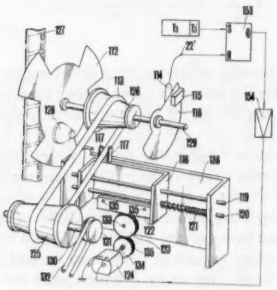
ling in the sensor, and a ferrous element relatively movable with respect to the sensor and magnets in a direction parallel to the broad plane of the sensor and effectively thereby to control voltage across the output leads during the application of a constant voltage to the input leads.

4,066,963

SYNCHRONIZATION SYSTEM OF THE CINE-PROJECTOR WITH THE SOUND TAPE REPRODUCER

Kiyoshi Takahashi, Kunitachi; Hiroyuki Takimoto, Tokyo; Takashi Yamada, Yokohama; Takashi Itani, Yokohama; Akira Ashida, Yokohama, and Kuniyoshi Suzaki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1976, Ser. No. 667,448
Claims priority, application Japan, Mar. 24, 1975, 50-35178
Int. Cl.[2] G03B *31/00*
U.S. Cl. 352—12 **11 Claims**



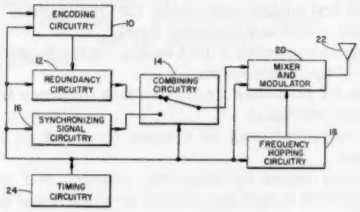
1. An improvement in a synchronization system, comprising:
1. sound tape reproducing apparatus for providing sound information, said apparatus including a signal generating means for producing a signal with a frequency corresponding to the tape speed;
2. a control means having at least two input terminals for receiving the output signals respectively emitted from various signals generating sources and one output terminal for detecting the phase difference of said two signals respectively received in said two input terminals to provide the output signals corresponding to said phase difference, one input terminal of said apparatus adapted to receive the output signal corresponding to the signal generating means of said sound tape reproducing apparatus;
3. a picture projection apparatus for providing picture information, said apparatus including:
a driving means including a motor of substantially constant speed of revolution at all times, and a rotary shaft driven by said motor,
a film feeding means,
a signal generating means for producing signals with a frequency corresponding to the film feeding speed of said film feeding means, signals generated in said signal generating means adapted to be supplied to the other input terminal of said control means,
a driven means having a rotary shaft to be actuated by a driving force of said driving means so as to operate said film feeding means;
4. a means for transmitting the rotational motion of the rotary shaft mounted on said driving means to the rotary shaft of said driven means as well as for optionally varying the transmission ratio of the rotational motion, said means including:
a pair of cone pulleys arranged to be inversely tapered off in a trapezoidal profile form with respect to each other, one of said cone pulleys being fixedly mounted on the rotary shaft of said driving means while the other of which is fixedly mounted on the rotary shaft of said driven means,
an endless belt stretched around said two cone pulleys,
a variable means for varying the position of said endless belt stretched around each of said cone pulleys; and
5. an operating means for actuating said variable means corresponding to the output of said control means, said operating means having the input terminal connected with the output of said control means and an output terminal connected with the input terminal of said variable means.

4,066,964

COMMUNICATION SYSTEM

Samuel T. Costanza, Santa Ana; Peter G. Franklin, San Marino; Frank L. Gebhardt, La Habra, all of Calif.; Jack D. Israel, Fort Wayne, Ind.; Charles R. Moore, Balboa Island, and Charles E. Wheatley, III, Manhattan Beach, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 6, 1967, Ser. No. 607,854
Int. Cl.[2] H04B *7/12*
U.S. Cl. 325—55 **54 Claims**

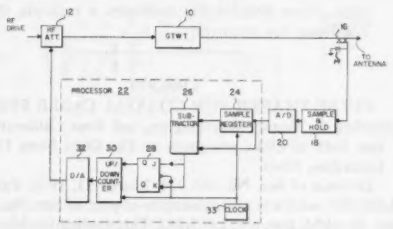


1. A communication system comprising:
A. a plurality of stations, selected said stations comprising a receiver, and at least one station comprising a transmitter;
B. means for varying the frequency of each receiver so that each receiver frequency-hops in an individual frequency-hopping sequence, said individual frequency-hopping sequence defining each individual receiver's address;
C. means for generating a transmitter carrier-wave that frequency-hops in the individual frequency-hopping sequence of any selected receiver, said means defining the transmitter's ability to address a transmission to any selected receiver;
D. means for varying the receiver-frequency, so that the receiver searches for a transmission addressed to said receiver;
E. means for stabilizing the receiver-frequency of said receiver, when said receiver finds a transmission addressed to it, to synchronize said receiver operation to said transmission;
F. means for producing a synchronizing-signal at said transmitter and for impressing said synchronizing-signal onto said addressed frequency-hopping carrier wave; and
G. means, activated at the receiver by said synchronizing-signal, for producing an activating-signal that synchronizes the receiver's operation to said synchronizing-signal.

4,066,965
RF GTWT SATURATING CIRCUIT

Leonard J. Schultz, Culver City; Alfred Steven Hamori, Huntington Beach, and Robert Rosen, Granada Hills, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 28, 1976, Ser. No. 727,559
Int. Cl.[2] H04B 1/04; H01J 25/34
U.S. Cl. 325—120 7 Claims



1. A circuit to maintain an RF gridded traveling wave tube in a saturation condition comprising:

an RF drive input;

a variable RF attenuator coupled to said RF drive input;

a gridded traveling wave tube coupled to the output of said variable RF attenuator, said gridded traveling wave tube having an output power which is maximum when said tube operates at its saturation point;

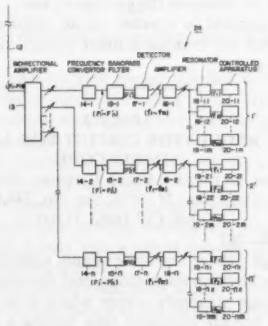
means for sensing the output power of said gridded traveling wave tube, said sensing means comprising sample and hold means coupled to said sensing means to detect the peaks of the output pulses of said gridded traveling wave tube; and

control means coupled to said sample and hold means and said variable RF attenuator for adjusting said variable RF attenuator in accordance with variations of the sensed output power of said gridded traveling wave tube to maintain said tube at its saturation point.

4,066,966
ALARM SYSTEM UTILIZING A BIDIRECTIONAL TRANSMISSION LINE IN CATV SYSTEM

Takeshi Takeuchi, Yokohama, and Hajime Masuda, Tokyo, both of Japan, assignors to Hochiki Corporation, Tokyo, Japan

Filed Apr. 15, 1976, Ser. No. 677,367
Int. Cl.[2] H04B 1/06
U.S. Cl. 325—308 6 Claims



1. A subscription alarm system having locations in group units, utilizing a bidirectional transmission line of a wired television broadcasting system, said system employing a plurality of alarm signal generators located at the subscribers' locations, generating low frequency alarm signals of frequencies common to the respective group units, said frequencies being different for subscribers in given respective group units, each of said alarm signal generators being provided for each subscriber including:

modulator for each of said respective group units, for modulating the low frequency alarm signals of said alarm signal generators with different high frequency carrier signals;

a receiving means coupled to the respective modulators through said bidirectional transmission line, for receiving said modulated alarm signals, said receiving means comprising frequency converting means for converting modulated alarm signals transmitted from said modulators into signals having lower frequencies than the carrier frequencies of said modulated alarm signals,

a plurality of band-pass filters for dividing said modulated alarm signals from said frequency converting means into modulated alarm signals for respective subscriber groups,

a plurality of detectors for demodulating said modulated alarm signals from said band-pass filters and extracting therefrom alarm signals for respective subscriber groups,

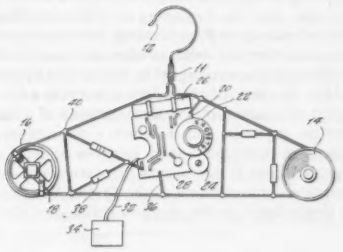
a plurality of resonators for separating an alarm signal for each subscriber from said alarm signals of said detectors, and

a plurality of alarm indicators for responding to each alarm signal from each of said resonators.

4,066,967
HANGER RADIO

John Jerome Spina, 57-30 59th St., Maspeth, N.Y. 11378

Filed June 11, 1976, Ser. No. 695,254
Int. Cl.[2] H04B 1/08
U.S. Cl. 325—310 7 Claims



1. In combination with a metal clothes hanger, a radio receiver comprising the usually known components including a volume control and a selective tuner, an antenna, and at least one loudspeaker; the metal clothes hanger being suitably electrically connected to the radio receiver, and the loudspeaker being mounted to the clothes hanger.

4,066,968
METHOD AND APPARATUS FOR PROVIDING A PERIODIC CONTROL SIGNAL, ESPECIALLY FOR CONTROLLING THE IGNITION OF AN INTERNAL COMBUSTION ENGINE

Serge Guipaud, Saint Papoul, France, assignor to Societe Anonyme pour l'Equipment Electrique des Vehicules S.E.V. Marchal, Issy-les-Moulineaux, France

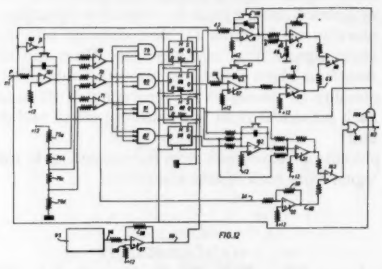
Filed Mar. 27, 1975, Ser. No. 562,844
Claims priority, application France, Mar. 28, 1974, 74.10861; Mar. 29, 1974, 74.11303
Int. Cl.[2] F02P 5/08; H03K 5/20
U.S. Cl. 328—1 4 Claims

1. In a method of assuring the periodic initiation of at least one operation in dependence upon at least one parameter, at least one of which parameters is dependent on the speed of rotation of a shaft, and in which said operation must be initi-

ated with a phase displacement with respect to a particular angular position of the shaft relative to a fixed point, the extent of said phase displacement being a function of the speed of rotation of the shaft, and a curve representing the angle of phase displacement as a function of said speed of rotation being a substantially straight line in a predetermined zone, said process comprising the step of

generating a signal $\bar{P}$ for a period $\bar{q}$ the duration of which corresponds to the passage of a rotating sector driven by said shaft and subtending an angle ϕ past said fixed point, the angle ϕ equal to $(2\pi - \phi)$corresponding to the absence of this signal for a period q, during which a signal P may be generated.

the improvement which comprises the steps of generating during one of the periods q and q following the beginning



of the signal P, a first voltage which is a linear function of one of said periods, storing this first voltage, generating during one of the succeeding periods a second voltage which is independent of the first and a linear function of the time since the beginning of said succeeding period of time of said signal P, generating a control signal when the second of the said voltages becomes equal to the first, and utilizing this control signal to initiate said operation, and in which the curve of phase displacement as a function of the speed of rotation of the shaft consists of a succession of straight segments and in which a discriminator between speeds is provided which receives at least one of the signals P and P and selects the parameters of the linear function corresponding to the first or the second voltage in dependence on the speed of rotation of the shaft.

4,066,969

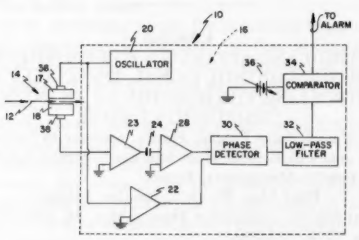
MULTIPLE SHEET DETECTING APPARATUS

Phillip W. Pearce, and Robert J. Hutchison, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 22, 1975, Ser. No. 615,651

Int. Cl.[2] B65H *7/12;* **G08C** *27/00;* **G08B** *21/00*

U.S. Cl. 328—5 **8 Claims**



1. Apparatus for detecting the presence of multiple sheets moving along a predetermined path, comprising:

a. means for producing a first time varying electrical signal;

b. first transducer means disposed on one side of the path and responsive to said first time varying signal for producing a time varying ultrasonic signal which impinges upon sheet(s) at a first position along the path;

c. second transducer means disposed on the opposite side of the sheet path and aligned with said first transducer means to receive at least a portion of the ultrasonic wave which impinged upon said sheet(s) for producing a second time varying electrical signal; and

d. phase comparison means responsive to said first and second time varying electrical signals for comparing their phase relationship and producing an output signal when such phase relationship indicates a multiple sheet feed condition has occurred.

4,066,970

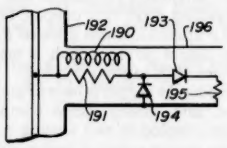
PULSE SHAPER FOR COAXIAL CABLE SYSTEM

Jonathan D. Young, Worthington, and Ross Caldecott, Columbus, both of Ohio, assignors to The Ohio State University, Columbus, Ohio

Division of Ser. No. 665,924, March 11, 1976, Pat. No. 4,028,707, which is a continuation-in-part of Ser. No. 437,927, Jan. 30, 1974, Pat. No. 3,967,282. This application Mar. 7, 1977, Ser. No. 775,385

Int. Cl.[2] H03K *3/86, 3/53*

U.S. Cl. 328—67 **5 Claims**



1. For use in conjunction with a high voltage pulse generator of the coaxial tube type wherein a charge is capacitively accumulated at one side of a gap within said tube until dielectric breakdown occurs thereacross to produce an output signal at an opposite side of said gap, said opposite side being connected with a coaxial cable having a central conductor and an outer conductive sheath, said output signal being characterized by a high voltage pulse signal portion of very short duration and a contiguous, subsequent sustained signal portion of substantially lower voltage, the improved generating circuit for forming substantially sustained trigger signals from the two said output signal portions and asserting said trigger signals at a load, said generating circuit comprising:

a resistance connected to said central conductor for acting in voltage dividing relationship with said load for forming a portion of sustained trigger signal; and

a choke coupled in parallel circuit relationship with said resistance for forming another portion of said sustained trigger signal.

4,066,971

VOLTAGE REGULATOR CIRCUIT FOR AN ELECTRON MICROSCOPE

Siemer Siems, 13 Eldwick Court, Potomac, Md. 20854

Filed Nov. 24, 1976, Ser. No. 744,865

Int. Cl.[2] H01J *21/00*

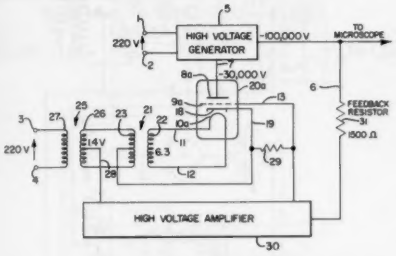
U.S. Cl. 328—267 **5 Claims**

1. In a high voltage regulator circuit, especially one adapted for use in an electron microscope, said circuit having a pair of supply voltage terminals across which a supply voltage is supplied, a voltage regulator tube having a plate electrode adapted to be coupled to a high voltage generator, a grid electrode adapted to be coupled to a high voltage amplifier, and a filament, coupled to said pair of supply voltage terminals, for receiving a filament supply voltage,

the improvement wherein

said tube further includes a cathode separate from said filament, and wherein said circuit further comprises

a first transformer having a primary winding connected across said pair of supply voltage terminals and a secondary winding,



a second transformer having a tapped primary winding, connected in parallel with the secondary winding of said first transformer, and a secondary winding connected across the filament of said tube, and

wherein the cathode of said tube is connected to the tapped primary winding of said second transformer.

4,066,972

SYSTEM FOR DEMODULATING ANGLE-MODULATED SIGNALS

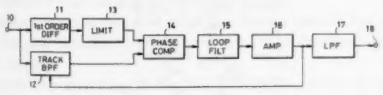
Yukinobu Ishigaki, Yamato, and Kohei Sasamura, Sagamihara, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Aug. 9, 1976, Ser. No. 712,707

Claims priority, application Japan, Aug. 15, 1975, 50-98498; Aug. 15, 1975, 50-98499

Int. Cl.[2] H03D *3/22*

U.S. Cl. 329—134 **9 Claims**



1. A system for demodulating angle-modulated signals comprising:

tracking band-pass filtering means supplied with an angle-modulated input signal, said filter means having a pass band with a center frequency which is variably controlled by a control signal;

first amplitude limiting means for limiting the amplitude of the angle-modulated input signal;

phase-shifting means for establishing a phase difference of 90° between a signal passing through said tracking band-pass filtering means and a signal passing through said amplitude limiting means;

phase comparing means responsive to the 90° phase difference signals for producing an output error signal in accordance with said phase difference;

means responsive to said output error signal for controlling said tracking band-pass filtering means; and

means responsive to said output error signal for deriving a demodulated signal.

4,066,973

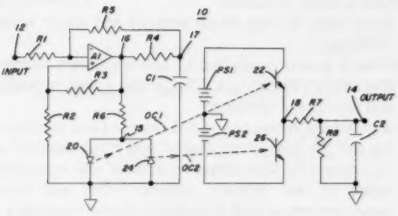
ANALOG SIGNAL ISOLATOR

Paul F. McNally, Gibsonia, Pa., assignor to Contraves-Goerz Corporation, Pittsburgh, Pa.

Filed Sept. 15, 1976, Ser. No. 723,496

Int. Cl.[2] H03F *3/38*

U.S. Cl. 330—10 **15 Claims**



12. An analog signal isolator comprising:

an input for receiving an analog signal;

a hysteretic switching device having an input and an output on which are provided a series of pulses in response to the signal applied to its input;

averaging means for providing some averaging of the pulses from said hysteretic switching device;

combining means connected between said input and the input to said hysteretic switching device for combining the signals applied thereto and providing the combined signal to the input of said hysteretic switching device;

feedback means connected between said averaging means and said combining means for providing a negative feedback signal from the averaging means to an input of said combining means;

optical coupling means operably responsive to the series of pulses on the output of said hysteretic switching device for providing a series of pulses, representative of the pulses from said hysteretic switching device, which are electrically isolated from said hysteretic switching device; and,

pulse to analog converting means connected to receive the series of pulses from said optical coupling means and converting them to an analog signal which is representative of but electrically isolated from the analog signal applied to said input.

4,066,974

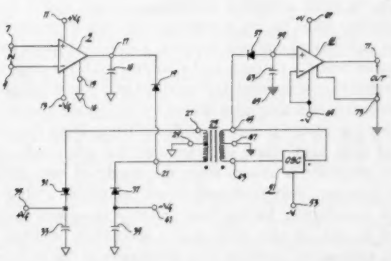
ISOLATION AMPLIFIER

Clyde J. Reinhard, LaHabra, Calif., assignor to The Birtcher Corporation, Los Angeles, Calif.

Filed July 23, 1976, Ser. No. 708,037

Int. Cl.[2] H03F *3/38*

U.S. Cl. 330—10 **4 Claims**



1. An isolation amplifier comprising:

input amplifier means for amplifying an electrical signal, said

input amplifier means having input, output, power supply and input reference ground terminals, the input terminals being adapted to receive an input signal;

output amplifier means for amplifying an electrical signal, said output amplifier means having input, output and output reference ground terminals, said reference ground terminals of said output amplifier means being isolated and independent from said input amplifier means input reference ground terminals;

a transformer having single primary and single secondary windings;

alternator means connected to said secondary winding for alternately presenting a voltage and a high impedance to said secondary winding;

first switching means connected between said primary winding and the output terminal of said input amplifier means for connecting said output terminal of said input amplifier means to said primary winding when said alternator means presents a high impedance to said secondary winding and for disconnecting said output terminal of said input amplifier means from said primary winding when said alternator means presents a voltage to said secondary winding, whereby a signal appearing on said output terminal of said input amplifier means in response to a signal applied to said input terminals is alternately connected to said primary winding; and

second switching means connected between said secondary winding and the input terminal of said output amplifier means for connecting said input terminal of said input amplifier means to said secondary winding when said alternator means presents a high impedance to said secondary winding and disconnecting said input terminal of said output amplifier means from said secondary winding when said alternator means presents a voltage to said winding whereby the signal appearing at said output terminal of said input amplifier is alternately coupled through said transformer to the input terminal of said output amplifier providing signal amplification from said input amplifier means to said output of said output means while isolating said input amplifier means input reference ground from said output amplifier means output reference ground.

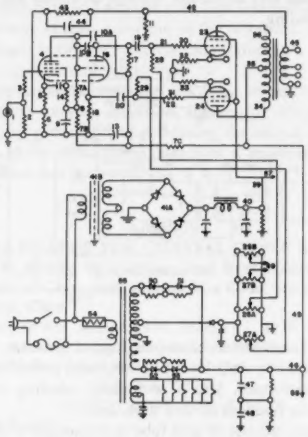
4,066,975

AUDIO AMPLIFIER WITH IMPROVED STABILITY

Walter W. Key, McLean, Va., and Eugene L. Coggins, Malvern, Pa., assignors to Paoli High Fidelity Consultants, Inc., Paoli, Pa.

Filed Sept. 2, 1975, Ser. No. 609,178
Int. Cl.[2] H03F *1/36, 3/28*
U.S. Cl. 330—81 **2 Claims**

1. In an audio amplifier including a single ended pentode preamplifier stage having a resistive and capacitive anode load and an unbypassed cathode resistive, a split load phase inverter having an anode, a cathode and a control grid, the control grid connected in cascade with the anode of said preamplifier stage, a push-pull power amplifier driven by said phase inverter such that one side of said power amplifier is driven from the cathode of said split load phase inverter and the other side of said power amplifier is driven from the anode of said split load phase inverter, said push-pull power amplifier including an output transformer having two primary windings each connected in one of said sides and a secondary winding from which a negative feedback loop terminates at the un-bypassed cathode resistance of the pentode preamplifier stage, and wherein high frequency parasitics are generated when said amplifier is connected to a loudspeaker which exhibits an impedance which is highly inductive, the improvement wherein said parasitics are substantially reduced by providing



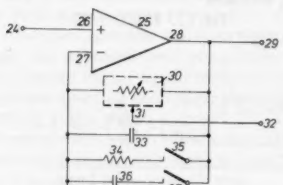
a means of lowering of the effective impedance of the phase splitter, as seen by the input of the push-pull power amplifier.

4,066,976

AMPLIFIER WITH VARIABLE GAIN

Gerhard Dickopp, and Ernst Schröder, both of Hannover, Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed July 6, 1976, Ser. No. 703,117
Claims priority, application Germany, July 5, 1975, 2530144
Int. Cl.[2] H03F *1/36;* H03G *3/20*
U.S. Cl. 330—86 **15 Claims**



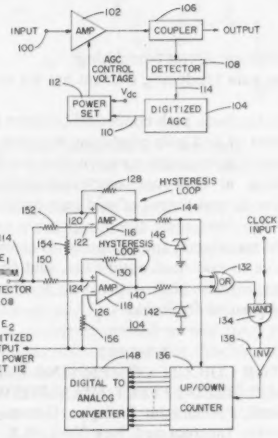
1. In an amplifier circuit arranged to be connected in a useful signal path and having a variable transmission factor and an effective transmission frequency band delimited by a lower limit frequency which can be varied as a function of a control voltage, the circuit including an amplifier member and circuit components defining a feedback path connected between the output of the amplifier member and an input thereof which is inverting with respect to the output signals of the amplifier member, the improvement wherein the components defining said feedback path comprise an electronically voltage-controllable resistor having a control voltage input and a first frequency dependent impedance connected in parallel with said resistor, and said circuit further comprises a second frequency dependent impedance connected between the inverting input of said amplifier member and a point at the circuit reference potential, and means for supplying the control voltage to the control voltage input of said controllable resistor.

4,066,977

DIGITIZED AGC AMPLIFIER WITH GAIN HYSTERESIS CIRCUIT

Ramon P. Chambers, Clearwater; David E. Sanders, St. Petersburg, and Robert S. Gordy, Largo, all of Fla., assignors to E-Systems, Inc., Dallas, Tex.

Filed Mar. 30, 1976, Ser. No. 671,846
Int. Cl.[2] H03G *3/20*
U.S. Cl. 330—129 10 Claims



1. A circuit for providing rapid automatic gain control for large variations in an input signal coupled thereto while concurrently preserving a predetermined low level modulation on said input signal at the output of said circuit, comprising:

AGC amplifier means having said input signal coupled thereto and having at least one output;

means for detecting said amplifier output and for deriving an output variable in amplitude with said detected amplifier output;

means for deriving a control voltage variable in discrete incremental steps in response to said detector output when said detector output variation exceeds a predetermined level;

means for coupling said control voltage to said AGC amplifier to provide automatic gain control,

said means for deriving a control voltage further comprising:

comparator means having two stable states and having a predetermined gain hysteresis range for changing from one of said stable states to the other of said stable states when said detector output variation exceeds said gain hysteresis range, and having an output;

means for deriving a clock input;

counter means;

logic means responsive to said comparator output for gating said clock to said counter means;

digital to analog converter means responsive to said counter for incrementally increasing or decreasing said control voltage in discrete steps; and

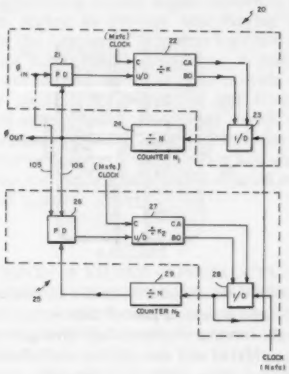
a feedback loop for sensing the output of said digital to analog converter and coupling said output to the reference input of said comparator.

4,066,978

DIGITAL PHASE-LOCKED LOOP FILTER

Duncan B. Cox, Jr., Manchester, and William H. Lee, Boston, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Division of Ser. No. 512,733, Oct. 7, 1974, Pat. No. 4,019,153.
This application Jan. 24, 1977, Ser. No. 761,853
Int. Cl.[2] H03B *3/04*
U.S. Cl. 331—1 A 8 Claims



1. A phase processing system for filtering an input signal to produce a filtered output signal comprising

a plurality of successively interconnected phase-locked loops, each of said loops including

means responsive to first and second signals for producing a phase detected output signal representing the phase difference between said first and second signals;

means responsive to said phase detected output signal and a first clock signal for digitally integrating said phase detected output signal to generate a first control signal whenever the value of said integrated signal reaches a first preselected level and to generate a second control signal whenever the value of said integrated signal reaches a second preselected level;

means responsive to said first and second control signals and to a second clock signal for controllably changing the number of pulses from said second clock signal in accordance with the generation of said first or second control signal to produce an intermediate clock signal;

means responsive to said intermediate clock signal of said pulse changing means signal for producing said second signal;

the first signal of the first one of said successively connected loops being said input signal and the second signal of said first of said successively connected loops being said filtered output signal;

the first signal of each of the remaining ones of said successively inter-connected loops being a signal selected from the pair of signals comprising the first signal and the second signal of the preceding loop;

a reference clock means for producing a reference pulse clock signal having a fixed frequency;

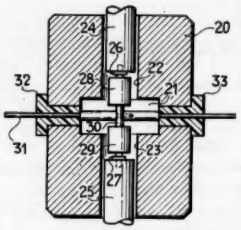
the first clock signal of each of said loops having a preselected frequency determined by the frequency of said reference pulse clock signal;

the second clock signal of the last of said successively connected plurality of loops having a preselected frequency determined by the frequency of said reference pulse clock signal and the intermediate clock signal of each of said loops except the first one of said loops being connected as the second clock signal of the pulse changing means in each preceding loop.

4,066,979
NEGATIVE RESISTANCE MICROWAVE CIRCUIT COMPRISING ONE OR MORE PAIRS OF DIODES

Felix Diamand; Guy Bourrabier, and Robert Antoine, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 18, 1976, Ser. No. 742,878
Claims priority, application France, Nov. 21, 1975, 75.35650
Int. Cl.[2] H03B 7/14
U.S. Cl. 331—56 4 Claims

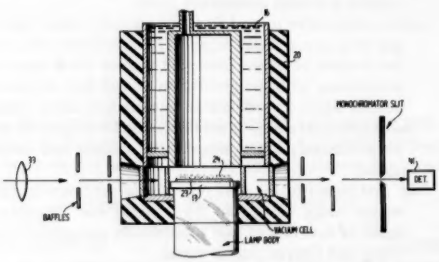


1. A negative-resistance microwave circuit comprising one wave-guide and at least a pair of chambers (22,23) with conductive walls forming a symmetrical arrangement in the right section plane (21) of said wave-guide, each chamber communicating with said wave-guide, and containing means (28, 29, 30) for supporting and polarizing a negative-resistance diode (26,27), said polarizing means forming with the walls of each chamber a coaxial line portion.

4,066,980
THIN FILM EXCITATION

Robert A. Young, R.R. No 2, Loretto, Canada

Filed July 9, 1975, Ser. No. 594,356
Int. Cl.[2] H01S 3/05
U.S. Cl. 331—94.5 G 6 Claims

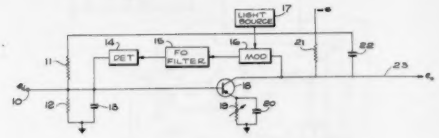


1. A device to produce and test a thin film of excited gas or liquid comprising
a helium resonance lamp having an emission at 584A;
an elongated window in said lamp of a material and design to be partially transparent to radiation at 584A;
a chamber surrounding said elongated window;
means for supplying a predetermined gas mixture containing helium to said chamber;
further windows located in the wall of said chamber adjacent to and spaced from said elongated window, said windows being transparent to emission emanating from the gas adjacent to the elongated window; and
the atmosphere in the space between said elongated window and said further windows having a predetermined optical transmission characteristic.

4,066,981
EMP RESISTANT OSCILLATOR WITH FIBER OPTIC FREQUENCY DETERMINING MEANS

Arnold M. Levine, Chatsworth, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 2, 1976, Ser. No. 746,797
Int. Cl.[2] H03B 5/02
U.S. Cl. 331—108 B 8 Claims

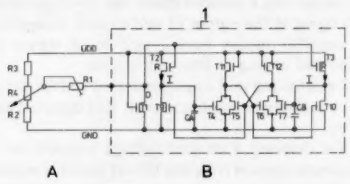


1. An oscillatory circuit comprising:
at least one gain producing element having an input and an output;
at least one feedback path connected between said input and said output of said gain producing element;
and frequency determining means within said feedback path comprising, at least one electric-to-optical transducer responsive to said output of said gain producing element, at least one fiber optic filter responsive to light signals from said transducer, and an optical-to-electric transducer responsive to said fiber optic filter, said fiber optic filter providing a phase shift within said feedback such as to produce positive feedback.

4,066,982
OSCILLATOR CIRCUIT COMPRISING INTEGRATED MIS FIELD-EFFECT TRANSISTORS

Klaus D. Strohl, Freiburg im Breisgau, Germany, assignor to ITT Industries, Incorporated, New York, N.Y.

Filed Mar. 11, 1977, Ser. No. 776,674
Claims priority, application Germany, Mar. 30, 1976, 2613421
Int. Cl.[2] H03K 3/283
U.S. Cl. 331—111 2 Claims

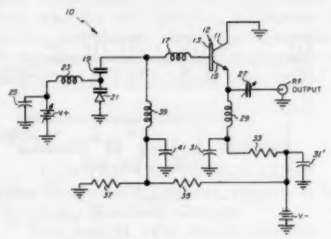


1. An oscillator circuit including temperature compensating means and means for coupling said oscillator circuit to an external power source having an internal resistance, comprising:
an RS flip-flop having first and second inputs;
first and second capacitors for coupling said first and second inputs respectively to ground;
first and second inverters, each containing a load transistor, said first and second inputs each controlled by one of said load transistors; and
a first transistor for providing temperature compensation of the oscillator frequency, said first transistor having a source electrode coupled to ground, a gate electrode coupled to a first source of supply voltage and a drain electrode coupled to the gate electrodes of said load transistors and to said external power source, said first transistor having a drain-source resistance in the order of the internal resistance of said external power source.

4,066,983
VOLTAGE CONTROLLED CLAPP OSCILLATOR HAVING OUTPUT ISOLATED FROM TUNED CIRCUIT

Zvi Gallani, Bedford, and Joseph A. Sullivan, Tewksbury, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 2, 1976, Ser. No. 746,775
Int. Cl.[2] H03B 5/12
U.S. Cl. 331—117 R 2 Claims

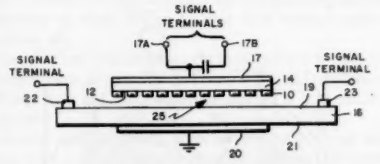


1. A voltage tunable oscillator comprising:
a. a transistor having first, second and third electrodes, said first electrode being grounded;
b. means connected to said second electrode and comprising an inductor, a capacitor and a varactor to form a resonant circuit across the interelectrode capacitance between said first and said second electrodes;
c. a feedback circuit comprising the interelectrode capacitance between said first and third electrodes;
d. an output circuit connected to said third electrode and including a variable capacitor for matching the impedance of said output circuit; and
e. means for biasing said second and third electrodes and for controlling the capacitance of the varactor thereby to control the frequency of operation.

4,066,984
SURFACE ACOUSTIC WAVE DEVICES FOR PROCESSING AND STORING SIGNALS

Ernest Stern, 31 Oxbow Road, Concord, Mass. 01742, and Kjell A. Ingebrigtsen, Einar Ofstis vei 27, 7000 Trondheim, Norway

Filed Aug. 11, 1976, Ser. No. 713,497
Int. Cl.[2] G06F 15/34; G06G 7/19; H01L 29/48; H03H 9/30
U.S. Cl. 333—30 R 17 Claims

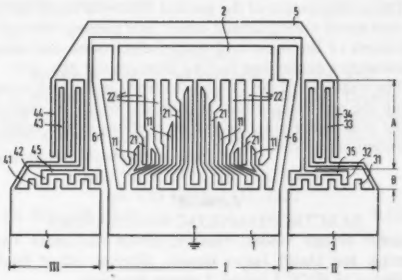


1. A device for processing and storing signals comprising
a first piezoelectric substrate capable of propagating acoustic wave signals on a selected surface thereof;
at least one transducer means formed on said selected surface for generating surface acoustic waves travelling on said surface along a selected direction thereof in response to electrical signals;
a semiconductor material positioned so as to have a first surface thereof adjacent and spaced from said selected surface of said first substrate to form an interaction region which includes the region at or near said surfaces and the spatial region therebetween;
an array of diode elements disposed at said first surface;
an array of islands corresponding to and disposed over said diode elements and regions adjacent thereto, said islands being formed of a highly resistive material;
a layer of conductive material disposed on a second surface of said semiconductor material, said layer forming an electrode;
at least one means for providing a signal at said at least one transducer means to produce at least one travelling acoustic wave signal along said selected surface of said first substrate; and
means for applying a second signal uniformly over said interaction region to provide time-varying properties thereof for the interaction of said at least one signal and said second signal thereby producing a spatial charge variation among said diodes so as to provide an altered stationary conductivity pattern in said semiconductor material as said acoustic wave signal travels along said selected surface of said first substrate, said altered stationary conductivity pattern being stored in said semiconductor material and representing said interacted at least one and second signals.

4,066,985
TELEVISION IF FILTER CONSTRUCTED IN ACCORDANCE WITH THE SURFACE WAVE PRINCIPLE

Wilhelm Kuny, Gruenwald, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed June 2, 1976, Ser. No. 692,223
Claims priority, application Germany, June 3, 1975, 2524649
Int. Cl.[2] H03H 9/04, 9/26, 9/32; H01L 41/10
U.S. Cl. 333—72 6 Claims



1. A television IF filter in accordance with the surface wave principle, comprising:
a piezoelectric substrate,
an input transducer and a pair of output transducers constructed in toothed interdigital form, said output transducers arranged symmetrically of said input transducer and all three carried on the same surface of said substrate,
said input transducer comprising a main section and a subsidiary section electrically and mechanically connected in parallel with said main section,
said main section tuned to the center IF frequency and includes teeth having a variable overlapping range corresponding to the function $y = \sin x/x$,
said subsidiary section having a tuned resonance to produce a step in the filter curve at the sound carrier frequency,
each of said output transducers comprising a main section and a subsidiary section each tuned to the resonance of the corresponding input transducer sections,
said output transducers connected in series with each other and said main and subsidiary sections of each of said output transducers connected in parallel,
said main and subsidiary sections of each of said output transducers comprising teeth having a constant overlapping range,
the length of said teeth of said subsidiary sections being less than the length of said teeth of said main sections in accordance with the level different at the sound and picture

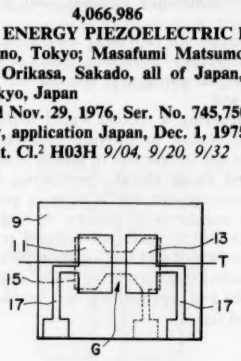
carrier frequency, respectively, of the pass characteristic curve.

4,066,986

TRAPPED ENERGY PIEZOELECTRIC FILTER

Katsuyoshi Takano, Tokyo; Masafumi Matsumoto, Kawagoe, and Kimihiko Orikasa, Sakado, all of Japan, assignors to Toko, Inc., Tokyo, Japan

Filed Nov. 29, 1976, Ser. No. 745,750
Claims priority, application Japan, Dec. 1, 1975, 50-143690
Int. Cl.[2] H03H *9/04, 9/20, 9/32*
U.S. Cl. 333—72 **6 Claims**



1. In a trapped energy type of electrical band pass filter including a polarized piezoelectric wafer, input and output electrodes secured to one major surface of the wafer, having like planar configurations, and spaced apart from each other at their adjacent edges by a constant width gap, and a planar ground electrode secured to the opposite major surface of the wafer and generally underlying the input and output electrodes, the improvements characterized by:

a. The configuration of the ground electrode being symmetrical about a longitudinal center line passing through the centers of the input and output electrodes, and about a transverse center line passing through the gap, and

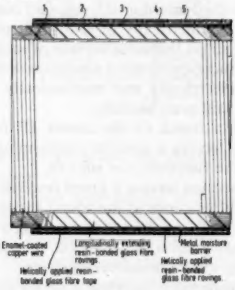
b. The width W_1 of the ground electrode in the area underlying the gap being different from the width W_2 thereof in the area underlying the center portions of the input and output electrodes.

4,066,987

ELECTROMAGNETIC WAVEGUIDES

Alexander Joseph Moore, Marlow; David Alexander Taylor, Kenton, and David James Greene, Harrow, all of England, assignors to BICC Limited, London, England

Claims priority, application in United Kingdom Mar. 29, 1974, 14175/74
Filed Mar. 25, 1975, Ser. No. 561,979
Int. Cl.[2] H01P *3/12*
U.S. Cl. 333—95 R **6 Claims**


Enamel-coated copper wire
Longitudinally extending resin-bonded glass fibre rovings
Metal moisture barrier
Helically applied resin-bonded glass fibre tape
Helically applied resin-bonded glass fibre rovings

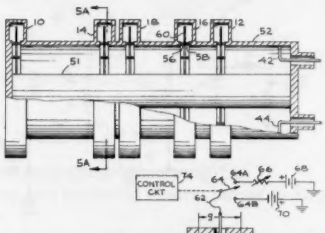
1. An electromagnetic waveguide comprising a circumferential electrically conductive layer and, surrounding the electrically conductive layer, a reinforcing wall comprising at least one layer of reinforcing elements bonded with resin, wherein reinforcing elements of said layer of the reinforcing wall extend substantially parallel to the axis of the waveguide throughout substantially the whole of its length.

4,066,988

ELECTROMAGNETIC RESONATORS HAVING SLOT-LOCATED SWITCHES FOR TUNING TO DIFFERENT FREQUENCIES

Arthur Karp, Palo Alto, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed Sept. 7, 1976, Ser. No. 720,556
Int. Cl.[2] H01P *7/04, 7/06, 1/20*
U.S. Cl. 333—82 B **15 Claims**



1. An electronically tunable waveguide resonator comprising:

walls defining an elongated waveguide resonator,

each of a plurality of means forming an inductive slot at said walls, said plurality of means being spaced along said walls at predetermined locations, along the axis of said waveguide resonator and each slot being substantially an annular slot about the axis, and

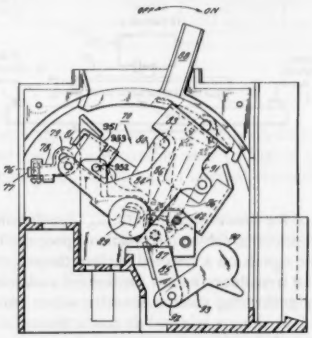
switch means for selectively shorting each of said plurality of means forming an inductive slot for altering the frequency tuning of said waveguide resonator.

4,066,989

TRIP UNIT TIE BAR HAVING INTEGRAL FLEXIBLY CONNECTED LINKS

Keith T. Krueger, Bellefontaine, Ohio, assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Apr. 28, 1976, Ser. No. 681,245
Int. Cl.[2] H01H *75/00, 77/00*
U.S. Cl. 335—9 **13 Claims**



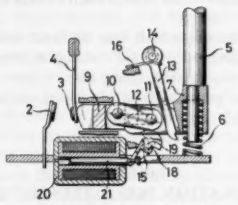
1. A multipole circuit breaker including cooperating contact means for each pole thereof, an operating mechanism operatively connected to said contact means, latch means for maintaining a releasable portion of said operating mechanism in a reset position wherein said operating means is effective to close said contact means, an automatic trip means including an indi-

vidual overload sensing means for each of said poles, said automatic trip means including a common trip bar means comprising a single elongated plastic element, said element including first means defining a pivot axis for said trip bar means, second means operatively connected to said latch means, third means for each of said poles extending laterally from joining locations remote from said axis into operative engagement with said automatic trip means whereby operation of the latter is effective to pivot said trip bar means about said pivot axis causing said second means to trip said latch means to release said portion whereby said operating mechanism opens said contact means, said element also including an elongated bar having its axis generally parallel to and laterally offset from said pivot axis; said joining locations being spaced along said bar.

4,066,990
ELECTRIC CIRCUIT BREAKER

Endre Csutor, Ludenscheid, Germany, assignor to Brown, Boveri & Cie, A.G., Mannheim, Germany

Filed June 14, 1976, Ser. No. 696,069
Claims priority, application Germany, June 26, 1975, 2528481
Int. Cl.² H01H *71/58*
U.S. Cl. 335—174 **4 Claims**



1. A circuit breaker with manually and automatic tripping means having a contact-operating lever held in the circuit-closed position against spring bias by means of an overdrawn over-center linkage, said linkage being held in position by a latch mechanism including a latch lever and acted upon by the tripping means of the breaker to unlatch said latch mechanism, wherein the improvement comprises in that

a. said overdrawn over-center linkage consists of a single toggle lever **(8)** having one end **(10)** pivotally affixed to a first straight path slide member **(9)**, the other end of said toggle lever **(8)** being affixed to a second straight path slide member **(7)** and movable by an operating handle in a direction at right angles to said first straight path slide member **(9)**;

b. the end of said toggle lever **(8)** being joined to said second straight path slide member **(7)** by a pin **(11)** slidable in an oblong hole **(12)** and abutting against a first latch lever **(13)**; and

c. wherein said first latch lever **(13)** is in latching engagement with a cooperating second latch lever **(15)** under the action of tripping means **(20,21)**, both said first latch lever **(13)** and said cooperating second latch lever **(15)** being under the action of spring means **(16,17)** tending to oppose unlatching thereof.

4,066,991
PRESSURE SUPPORT FOR LIMITING STRAIN IN A SUPERCONDUCTING WINDING

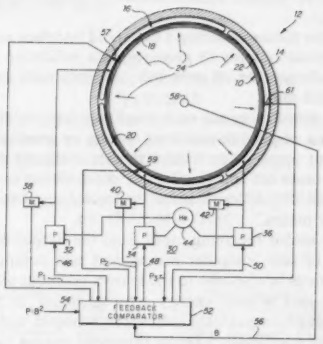
Peter G. Marston, Gloucester, and John J. Nolan, Cambridge, both of Mass., assignors to Sala Magnetics, Inc., Cambridge, Mass.

Filed Nov. 20, 1975, Ser. No. 633,975
Int. Cl.² H01F *7/22*
U.S. Cl. 335—216 **13 Claims**

1. A pressure support unit for limiting strain in a superconducting magnet coil induced by the magnetic field generated by the magnet coil comprising:

a restraining member surrounding said superconducting magnet coil for withstanding the force of the magnetic field generated by said superconducting magnet coil;

a pressure compartment disposed between said superconducting magnet coil and said restraining member and

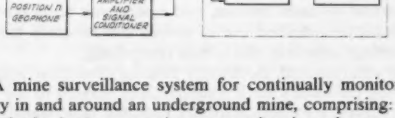


having a least one segment for receiving fluid pressurized proportional to the intensity of the field generated by said superconducting magnet coil for counterbalancing the force produced by the magnetic field and communicating a portion of the stress and resultant strain to said restraining member and reducing the strain in the said superconducting magnet coil.

4,066,992
SEISMIC MINE MONITORING SYSTEM

Paul L. Buller; William L. Chapman; Bobby J. Thomas, and James C. Fowler, all of Ponca City, Okla., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 9, 1975, Ser. No. 620,976
Int. Cl.² G01V *1/16, 1/22*
U.S. Cl. 340—15.5 MC **5 Claims**



1. A mine surveillance system for continually monitoring activity in and around an underground mine, comprising:

plural seismic energy sensing means wherein each comprises a geophone which is permanently encased and buried underground at preselected depths at each of selected positions of the earth surface over said underground mine,

plural signal conditioning means each disposed proximate a respective sensing means and receiving sensed seismic signals therefrom, and each of said signal conditioning means comprises gain controlled amplifier means wherein feedback to amplifier output to a field effect transistor circuit controls amplifier output to allow high gain output for a very brief interval relative to the characteristic time of the seismic signal input whereupon the output is clamped to a selected low amplitude for a predetermined long duration relative to said brief interval which duration reflects the character, propensities, and reoccurrences probabilities of seismic signals to be encountered at the mine,

means for modulating seismic signal output from each of said

signal conditioning means for carrier transmission to a central position,

receiving means at said central position for filtering and demodulating each of said transmission signals to regenerate said plurality of seismic signals,

plural threshold detection means each receiving one of said seismic signals to generate a threshold output when respective seismic signals exceed a predetermined amplitude,

computer means including a threshold interface receiving all threshold outputs to generate data indication of seismic disturbance for all selected positions over said underground mine,

carrier detector means each receiving demodulation output from a respective receiving means to generate a carrier output signal when respective carrier signals are present, and means for applying said detected carrier output signal to said threshold interface for logical input to said computer means,

display means receiving input from the output data indication of said computer means, and said computer means functions in response to the known positions and depth of each said seismic energy sensing means to process all threshold output data indications wherein said computer means continually checks threshold output data indications to assure that three or more of said threshold outputs were generated whereupon location of the seismic disturbance is then calculated for output display in relation to the bounds of said underground mine on said display means.

4,066,993

LIMITED-RANGE SEISMIC CONTROL SYSTEM

Carl H. Savit, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed Nov. 8, 1976, Ser. No. 739,415
Int. Cl.² G01V *1/22, 1/02*
U.S. Cl. 340—15.5 TS **26 Claims**

1. A limited-range radio communications system for transmitting command and data signals between a seismic recording apparatus and at least one mobile unit having a seismic signal generator mounted thereon, said mobile unit being positioned adjacent to a desired line of survey and remotely from said recording apparatus, the system comprising;

an unterminated, electrically floating conductor positioned on the earth's surface substantially parallel to the line of survey, for electrostatically radiating radio signals;

first transceiver means associated with said recording apparatus and coupled to said floating conductor for transmitting coded command signals to and receiving data signals from said floating conductor;

second transceiver means mounted on said mobile unit and having an antenna coupled thereto for receiving command radio signals from and for electromagnetically transmitting data radio signals to said floating conductor.

4,066,994

WELL DATA TELEMETRY BY EXPLOSIONS

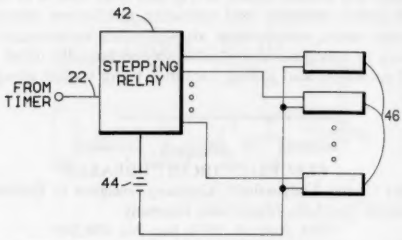
Jay G. Patchett, and Charles F. Hadley, both of Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 17, 1976, Ser. No. 742,490
Int. Cl.² G01V *1/40*
U.S. Cl. 340—18 NC **7 Claims**

1. Subsurface parameter measurement and telemetering apparatus for use at the bottom of a plugged borehole comprising:

sensing means for sensing a subsurface parameter and generating an electrical signal related to the value of such parameter,

timing means coupled to said sensing means for generating two time intervals, a first time interval being a preselected time delay interval and a second being a time interval



proportional to the electrical signal generated by said sensing means, said timing means having an output for providing pulses at the end of each of said two time intervals,

a plurality of charges which may be fired electrically, and

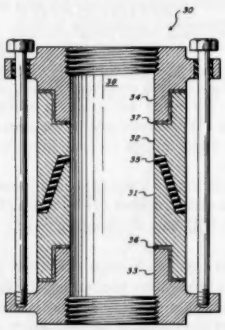
firing means coupled to said timing means and to said charges for sequentially firing one of said charges in response to the generation of a pulse at the output of said timing means.

4,066,995

ACOUSTIC ISOLATION FOR A TELEMETRY SYSTEM ON A DRILL STRING

Hugh B. Matthews, Acton, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 12, 1975, Ser. No. 648,074
Int. Cl.² G01V *1/40*
U.S. Cl. 340—18 LD **3 Claims**



1. A system for the transmission of acoustic signals representative of down hole drilling parameters encountered during operation of a drilling apparatus that includes a rotating table, a drill string coupled thereto, and a drill bit, driven through said drill string, wherein said acoustic signals are caused to propagate along said drill string on which acoustic noise exists that extends over an acoustic frequency spectrum having a lower acoustic frequency band and an upper acoustic frequency band, said system comprising:

an acoustic receiver coupled to said drill string to receive signals in an acoustic frequency passband within said upper acoustic frequency band of said acoustic noise frequency spectrum;

an acoustic transmitter coupled to said drill string at a predetermined distance from said acoustic receiver for transmitting an acoustic signal within said acoustic frequency passband of said receiver;

instrumentation means coupled to said acoustic transmitter for modulating said transmitted acoustic signal, said modulation representative of said downhole drilling parameters;

a first lowpass acoustic filter coupled between said instrumentation means and said drill bit comprising a first mass section, a second mass section, a compliance element, shaped in cross-section as an elongated S, circumferentially therebetween, and first and second coupling sections for coupling said first and second mass sections between sections of said drill string, said first and second coupling sections circumferentially coupled respectively to said first and second mass sections via first and second damping elements both having longitudinal and transverse sections, whereby noise generated during the drilling operation at acoustic frequencies within said passband of said receiver are attenuated for longitudinal, transverse and torsional modes; and

a second lowpass acoustic filter coupled between said acoustic receiver and said rotating platform comprising a first mass section, a second mass section, a compliance element, shaped in cross-section as an elongated S, circumferentially therebetween, and first and second coupling sections for coupling said first and second mass sections between sections of said drill string, said first and second coupling sections circumferentially coupled respectively to said first and second mass sections via first and second damping elements both having longitudinal and transverse sections, whereby noise at acoustic frequencies within said passband of said receiver, generated by the rotation of said platform and the operation of equipment thereabove are attenuated for longitudinal, transverse and torsional acoustic modes.

4,066,996

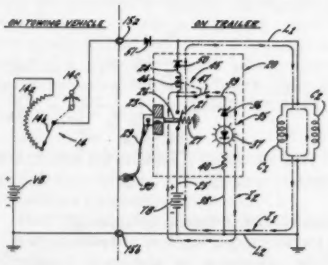
BREAKAWAY PROTECTION FOR ELECTRICALLY CONTROLLED TRAILER BRAKES

Donald L. Davis, Rockford, Ill., assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Feb. 20, 1976, Ser. No. 659,600

Int. Cl.[2] B60Q *1/44*; B60T *7/20*

U.S. Cl. 340—52 R **5 Claims**



1. A safety system for use with a trailer adapted to be removably hitched to a towing vehicle and having a brake which is engaged when an associated coil is energized by a battery carried by said trailer, said safety system including first and second separable parts connectable to the trailer and the towing vehicle, respectively, a switching device rendered conductive when said first part is separated from said second part, means for connecting said switching device in a series path with said battery and said coil whereby current is normally supplied to said coil from said battery when said switching device is conductive, an indicator which produces a detectable signal when a voltage is applied thereto, and circuit connections placing said indicator electrically across at least one of said battery or said coil when said first and second parts are separated, the improvemet in said safety system comprising, means for sensing the current in said series path when said switching device is conductive and for disabling said indicator unless the magnitude of such current equals or exceeds a predetermined threshold value.

4,066,997

FLUID LEVEL INDICATOR FOR TANDEM MASTER CYLINDER

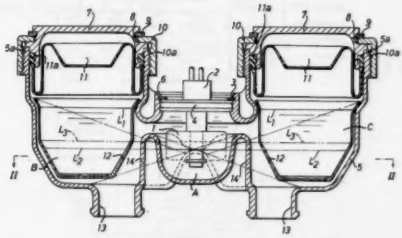
Atsushi Ohmi, Anjo, and Masayoshi Katagiri, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kogyo Kabushiki Kaisha, both of, Japan

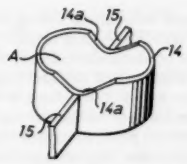
Filed June 21, 1976, Ser. No. 698,113

Claims priority, application Japan, June 23, 1975, 50-77743

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—59 **4 Claims**





1. In a tandem master cylinder having a casing defining front and rear fluid chambers therein to store an amount of brake fluid, said fluid chambers being in fluid communication to each other;

a lateral partition provided within said casing between said two fluid chambers to block the relative fluid communication between said fluid chambers after the fluid level within both said chambers drops below a predetermined lowest level defined by said lateral partition;

an annular partition provided on said lateral partition between said two fluid chambers to form a float chamber therein, said annular partition being higher than said lateral partition in a predetermined length and including at least a recessed portion adjacent to said lateral partition to permit fluid flow from said two chambers into said float chamber, the bottom of said recessed portion corresponding to an upper surface of said lateral partition to block fluid communication between said two chambers and said float chamber after the fluid level within said float chamber drops below said predetermined lowest level;

switch means mounted on said casing between said two chambers and adapted to actuate a warning device upon closing of said switch means; and

a single float disposed within said float chamber for vertical movement in response to variation of the fluid level within said chambers and operatively connected to said switch means;

whereby said switch means is closed to actuate said warning

device only when the fluid level within said fluid chambers drops below the predetermined lowest level.

4,066,998

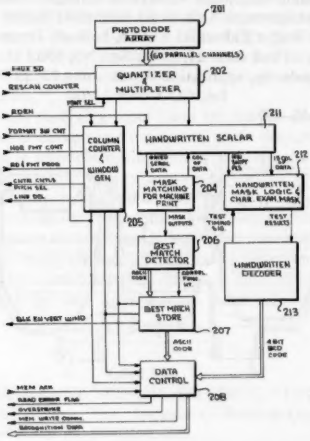
METHOD AND APPARATUS FOR DISCRIMINATING BETWEEN CHARACTERS IN CHARACTER RECOGNITION SYSTEMS

Harrison B. Lidkea, Satellite Beach, Fla., assignor to Optical Business Machines, Inc., Melbourne, Fla.

Filed Apr. 30, 1976, Ser. No. 682,026

Int. Cl.[2] G06K *9/12*

U.S. Cl. 340—146.3 AC **13 Claims**



1. In a character recognition system of the type wherein a character fascsimile, in the form of electrical signals, is examined for purposes of identification, said character being superposed on a grid, wherein said electrical signals are binary levels representing respective grid locations in which the presence of a character portion is represented by one binary level and the absence of a character portion is represented by another binary level, said grid locations being arranged in a plurality of vertical columns and horizontal rows, a method for improving character identification reliability comprising the steps of:

shifting a row at a time of said binary signals into an examination mask in the form of a shift register having as many storage locations as there are binary signals in a row;

simultaneously examining the entire row of binary signals in said examination mask to determine the left-most and right-most storage locations containing a character portion; and

sequentially interrogating only the grid locations in the examined row which lie between said left-most and right-most storage locations to determine the presence and absence of character portions.

4,066,999

METHOD FOR RECOGNIZING CHARACTERS

Arie Adriaan Spanjersberg, Leiderdorp, Netherlands, assignor to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie, The Hague, Netherlands

Filed May 28, 1976, Ser. No. 690,855

Claims priority, application Netherlands, June 2, 1975, 7506520

Int. Cl.[2] G06K *9/00*

U.S. Cl. 340—146.3 S **9 Claims**

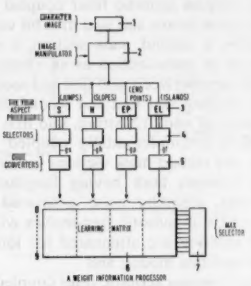
1. A device for recognizing characters comprising:

A. means for manipulating the pattern of each character for scanning said pattern from a plurality of aspects,

B. means for detecting a plurality of features in each aspect and classifying the detected features in each of the aspects in a plurality of groups,

C. a plurality of register means for recording the number of times the detected features of each aspect occur for each class of patterns of the same character,

D. means for weighing the features detected in each pattern depending upon the shape of the pattern,



E. means for selecting features of the characters on the basis of the values of said weights,

F. a matrix means for multiplying the values of the weights by the number of times that feature has been stored in said recording means, and

G. means for selecting the largest multiplied value for indicating the class of the features and the character to be recognized.

4,067,000

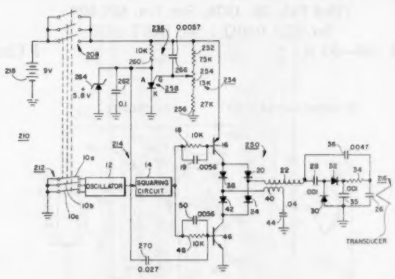
REMOTE CONTROL TRANSMITTER WITH AN AUDIBLE BATTERY LIFE INDICATOR

David John Carlson, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 28, 1976, Ser. No. 691,188

Int. Cl.[2] H04Q *9/10;* **H04B** *11/00;* **G08B** *21/00*

U.S. Cl. 340—171 R **7 Claims**



1. A remote control system comprising:

means for selecting a function to be controlled;

means for generating an ultrasonic frequency electrical signal in accordance with the function selected;

means for supplying energy to said ultrasonic frequency electrical signal generating means;

means for detecting when the energy available from said energy supplying means falls below a predetermined level;

means for generating an audio frequency electrical signal when the energy available from said energy supplying means has fallen below said predetermined level; and

ultrasonic transducer means for normally generating an inaudible acoustic signal in response to said ultrasonic frequency electrical signal, said audio frequency signal having a predetermined frequency selected so that said

ultrasonic transducer means generates an audible acoustic signal in response to said audio frequency electrical signal.

4,067,001

LINE FOR TRANSPORTING CHARGES FROM STORAGE ELEMENTS IN A STORAGE FIELD

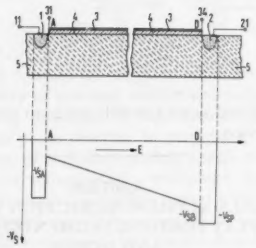
Kurt Hoffmann, Taufkirchen, Germany, assignor to Siemens Aktiengesellschaft, Germany

Filed May 25, 1976, Ser. No. 689,809

Claims priority, application Germany, May 28, 1975, 2523683; Feb. 17, 1976, 2606254

Int. Cl.[2] G11C *11/40, 13/00*

U.S. Cl. 365—174 **9 Claims**



1. A method for rapidly transferring a charge from a first point to a second point along a line having a semiconductor material region, a layer of insulating material on said region, and a resistance layer on said layer of insulating material, said resistance layer having first and second end terminals and a first intermediate terminal, comprising the steps of:

a. maintaining a relatively low potential on said first end terminal;

b. introducing a charge into one end of said semiconductor material region adjacent the first end terminal;

c. transporting said charge from near the first end terminal to near the first intermediate terminal, by applying a relatively high potential to said first intermediate terminal to create a continuously changing potential beneath said resistance layer between the first end and first intermediate terminals;

d. transporting said charge from near the first intermediate terminal to near the second end terminal by applying a relatively low potential to said first intermediate terminal to replace the high potential and applying a relatively high potential to said second end terminal to create a continuously changing potential beneath said resistance layer between the second end and first intermediate terminals.

4,067,002

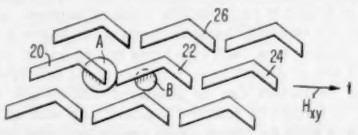
FIELD ACCESS OF BUBBLE DOMAIN LATTICE

Hsu Chang, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1975, Ser. No. 645,594

Int. Cl.[2] G11C *19/08*

U.S. Cl. 365—43 **24 Claims**



21. An apparatus for translating a two-dimensional lattice of interacting magnetic bubble domains in response to the reorientations of a magnetic field, comprisng:

a magnetic medium in which said bubble domains can be moved, and

an array of magnetic elements where said elements are located in positions in said array to provide a substantially even spatial distribution of magnetic poles attractive to said bubble domains when said magnetic field is present, said magnetic elements having geometries and thicknesses to provide an array in which the driving forces on said bubble domains in said two-dimensional lattice are substantially the same during different orientations of said magnetic field to thereby translate said lattice while substantially maintaining its integrity.

4,067,003

PASSIVE REPLICATOR

Peter K. George, Placentia, and Tsutomu Kobayashi, Orange, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 9, 1976, Ser. No. 656,688

Int. Cl.[2] G11C *11/14*

U.S. Cl. 365—12 **8 Claims**

1. A passive replicator device comprising

first propagation path means for propagating information therealong in a first direction,

second and third propagation path means for propagating information therealong,

said second and third propagation paths disposed adjacent to said first propagation path in order to receive information from said first propagation path such that information is propagated in said first, second and third propagation paths substantially in said first direction,

said second and third propagation paths having ends thereof substantially adjacent to each other and in substantially parallel arrangement,

said first propagation path having an end thereof adjacent to said ends of said second and third propagation paths and substantially in abutment therewith,

a plurality of elongated bars in substantially parallel arrangement,

said plurality of elongated bars disposed adjacent to said ends of said first, second and third propagation paths,

an end of at least one of said elongated bars interposed between said end of said first propagation path and the end of at least one of said second and third propagation paths whereby said plurality of elongated bars will receive information propagating along said first propagation path and expand said information to substantially encompass said ends of said second and third propagation paths,

each of said plurality of elongated bars having length substantially greater than the length of said ends of said first, second and third propagation paths, and

a cutter bar associated with said elongated bars,

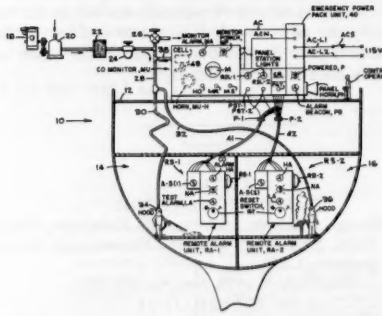
said cutter bar including an elongated bar having a relatively shorter bar portion disposed at an angle to said elongated bar and projecting between said ends of said second and third propagation paths.

4,067,004

REMOTE PERSONNEL STATION ALARM SYSTEM

William Gulbrantson, Portland, Oreg., assignor to FMC Corporation, San Jose, Calif.

Filed Aug. 5, 1976, Ser. No. 711,950
Int. Cl.[2] G08B 17/10
U.S. Cl. 340—237 R **6 Claims**



1. A remote personnel station alarm system comprising an external station, a remote personnel station, means at said external station for supplying air to said remote station, a gas monitor unit at said external station having means for providing a primary alarm signal upon detection of dangerous gas in said air supply, a remote alarm unit normally at said remote station and having gas alarm warning means, means for electrically connecting said remote alarm unit to said gas monitor unit for providing a gas alarm warning at said remote alarm unit in response to a primary alarm signal from said monitor unit, and an electric power supply for said units; the improvement wherein said electrical connecting means comprises an external panel assembly electrically connected to said monitor unit and to said power supply, an electric signal wire cable connected to said remote alarm unit at one end and having plug means at the other end for connection to corresponding plug means for said panel assembly so that said remote unit can be disposed at said panel assembly for testing and at said remote station during operation, said panel assembly having a station test switch for said remote station and a normally dark station indicator light, said remote alarm unit also having a test alarm light and a light flasher, and means for causing operation of said station test switch at the panel assembly to light said station indicator light at said panel assembly and to light said test alarm light at the remote alarm unit through said flasher without operating the gas alarm warning means at said remote alarm unit.

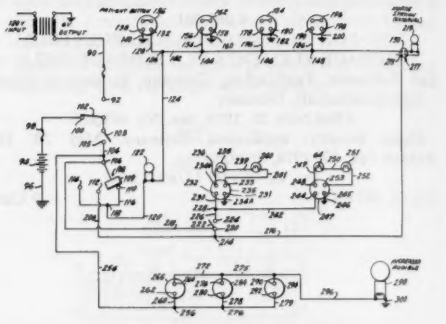
4,067,005

INVALID BED SYSTEM

Joshuah Levy; Isaac Levy, both of 802 Ave. "N", and Frank H. Klein, 614 Ave. "J", all of Brooklyn, N.Y. 11230

Continuation-in-part of Ser. No. 572,720, April 29, 1975, abandoned. This application Oct. 12, 1976, Ser. No. 731,366
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—279 **15 Claims**

15. In a hospital having a bed with at least one rail, a nurse's station located at a distance from said bed, a wall terminal in proximity to said bed and means connecting said wall terminal to said nurse's station, the warning system combination of first and second elongated pressure sensitive switches on top of said rail, said first pressure sensitive switch being actuatable by light pressure, said second pressure sensitive switch being actuatable by heavy pressure, a first warning device at said nurse's station, a first lead connecting said first warning device to said connecting means, a second warning device at said nurse's station, and a second lead connecting said second warning device to said connecting means so that actuation of said first switch serves to actuate said first warning device, and



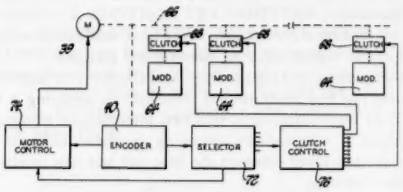
actuation of said second switch serves to actuate said second warning device.

4,067,006

CHANGEABLE ALPHANUMERIC SIGN WITH OPAQUE TAPE DISPLAY FORMING SEGMENTED CHARACTERS AND WORDS

William H. Saylor, South Laguna, and James O. Narey, Westminster, both of Calif., assignors to Associated Data Concepts, Costa Mesa, Calif.

Continuation-in-part of Ser. No. 546,696, Feb. 3, 1975, abandoned. This application Dec. 3, 1975, Ser. No. 637,434
Int. Cl.[2] G09F 11/18
U.S. Cl. 340—325 **6 Claims**

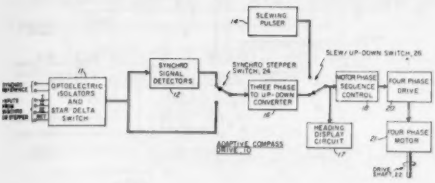


1. A changeable sign formed of plural alphanumeric characters, said sign comprising: plural window areas each adapted to display only a single character with discrete segments of the character allocated to discrete window segments of the window area, plural sets of display tapes, each set of display tapes being disposed at a different one of said window areas for collectively forming any of said characters one at a time, each tape having character segments imprinted thereon in a predetermined order at discrete parts of the tape along the length thereof, the number of character segments corresponding to the number of characters to be displayed and each segment corresponding to that portion of a character which is to occupy the corresponding discrete window segment when the character is displayed, movable support means for supporting each set of tapes so that only one of said tape segments can be seen at a time at each discrete window segment, with all segments of a selected character displayed together in the respective window area, each tape being one character wide and the plural sets of display tapes being arranged side-by-side so that plural characters can be displayed side-by-side whereby a word is formed by selectively positioning each set of tapes, a motor, a separate clutch means connected between said motor and the movable support means of each set of display tapes, and means for selectively actuating said clutch means for concurrently but independently displacing all sets of display tapes to change the characters of the sign.

4,067,007
ADAPTIVE COMPASS DRIVE SYSTEM

Joseph E. Bryden, Framingham, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 5, 1976, Ser. No. 647,275
Int. Cl.[2] H03K 13/02
U.S. Cl. 340—347 SY 13 Claims



1. An adaptive compass drive system capable of operation over a wide variety of compass outputs and supply voltages and frequencies by provision of combination signals which employs a digital phase detector to convert gyro compass outputs in the form of multiphase analog signals to a stream of up-down pulses for activation of a multiphase stepper motor and a converter to which the compass output when in the form of overlapping digital signals is converted to said stream of up-down pulses for actuation of said stepper motor coupled to a bearing indicator which includes the method for providing direction information from the gyro compass by producing a combination signal from a single selection of synchro and stepper signals comprising the steps of:

converting said signals from said gyro compass to said combination signals having a predetermined amplitude and timing relationship;

coupling said combination signals to a decoder circuit and converting multi-phasic input signals having overlapping active states to multi-phasic signals in which only a single phase of said signals is activated at one time;

determining a first condition when said multi-phasic signals represent a first direction of of rotation and a second condition when said multi-phasic signals represent a second direction of rotation; and

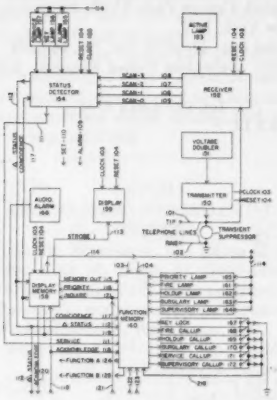
providing first and second pulse streams, each pulse in each of said pulse streams representing a predetermined amount of rotation, pulses of said first stream being produced upon said first condition and pulses of said second stream being produced upon said second condition.

4,067,008
MULTIPLEX INTERROGATION SYSTEM USING PULSES

Joseph B. Sprowls, III, Broomfield, Colo., assignor to Denver Fire Reporter & Protective Co., Inc., Denver, Colo.

Filed Dec. 29, 1975, Ser. No. 644,913
Int. Cl.[2] G08B 29/00
U.S. Cl. 340—409 15 Claims

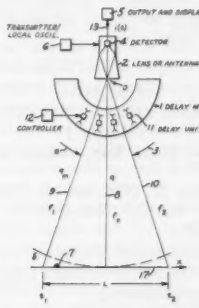
1. In an interrogation and response system for monitoring the status of a plurality of protection zones of the type in which the protection zones are interrogated in sequence repeatedly by a series of interrogation signals, each sequential interrogation of all the protection zones constituting a complete sequential scan thereof, and reply signals are sequentially supplied according to the status of each protection zone in response to the respective sequential interrogation signals, the improvement comprising: means for receiving said reply signals and generating for each of the protection zones a pattern of said reply signals for at least four of the most recent ones of said complete sequential scans of said zones; and means responsive to said reply signal patterns for determining and indicating therefrom the status of each particular protection zone, said zone status determining and indicating means indicating a change in status of one of said zones only when the entire pattern of the associated one of said reply signal patterns indicates a change in status whereby to substantially eliminate the effect of spurious signals on said system.



4,067,009
BEAM FOCUSED SYNTHETIC APERTURE

James Nickolas Constant, 1603 Danbury Drive, Claremont, Calif. 91711

Filed Aug. 1, 1975, Ser. No. 601,392
Int. Cl.[2] G01S 9/02
U.S. Cl. 343—5 CM 30 Claims



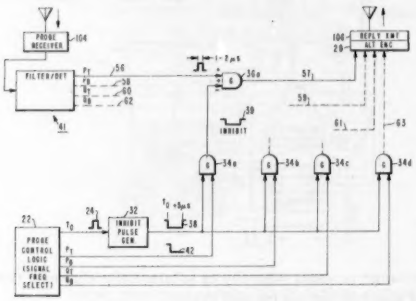
1. In a synthetic aperture having first means for forming a beam for receiving radiation from a target, a detector for a radiation beam from said first means, and an output and display for using and viewing detected signals from the detector, the improvement comprising:

a delay means inserted between the target and the detector, said delay means including a spatial matched filter for said radiation from said target moving through the field of view of said radiation beam.

4,067,010
CIRCUIT FOR INHIBITION OF AUTOGENETIC FALSE ALARMS IN A COLLISION AVOIDANCE SYSTEM

James Robert Hall, Canoga Park, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 643,328
Claims priority, application United Kingdom, Apr. 14, 1975, 15217/75
Int. Cl.[2] G01S *9/56*
U.S. Cl. 343—6.8 LC **3 Claims**



1. A circuit in a probe-reply station of a collision avoidance system for inhibiting autogenetic false alarm signals generated by said station, comprising the combination of:

means for transmitting periodic probe signals including means for randomly selectively generating probe signals of different types and transmitting one probe signal of one of said types;

normally operative probe reply means for transmitting a reply signal in response to received probe signals; and

means responsive to said probe signal transmitting means indicative of the transmission of a probe signal for inhibiting said normally operative probe reply means from transmitting a reply signal for a predetermined but relatively short period of time following the transmission of each of said transmitted probes;

wherein said probe reply means includes means for receiving said probe signals, and means responsive to received probe signals for generating a reply signal corresponding to each of said probe signal types; and

wherein said inhibiting means includes means for inhibiting the transmission of said reply signals that correspond to said one probe signal type.

4,067,011
DIGITAL TRANSPONDER UNIVERSAL PULSE ASSEMBLY

Raymond L. Althaus, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

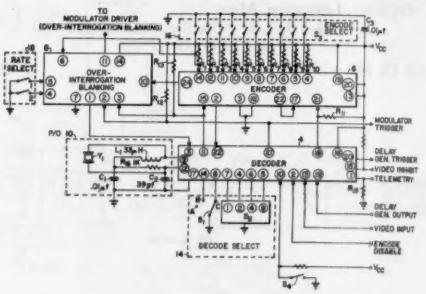
Filed Oct. 22, 1976, Ser. No. 734,786
Int. Cl.[2] G01S *9/56*
U.S. Cl. 343—6.8 LC **6 Claims**

1. A universal pulse assembly apparatus for a transponder the transponder having a receiver and a transmitter, the apparatus in combination comprising:

means for decoding a coded video pulse signal from the receiver, said decoding means having first selecting means for determining one of a plurality of predetermined video pulse codes;

means for encoding a modulating pulse signal for the transmitter, said encoding means having second selecting means for determining one of a plurality of predetermined transmitter pulse codes; and

means for controlling the pulse response rate of the transponder; said controlling means having third selecting means for determining one of a plurality of maximum allowable transponder response rates, said controlling means operable to limit modulation of the transponder

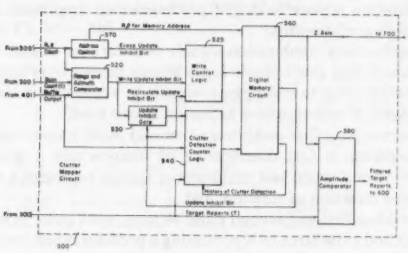


when said response rate of the transponder exceeds said selectable maximum response rate.

4,067,012
TRACKING FEEDBACK CLUTTER MAPPER CONTROL DEVICE

Vernon H. Platt, Fullerton, and Richard D. Wilmot, Buena Park, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 25, 1976, Ser. No. 717,712
Int. Cl.[2] G01S *7/46*
U.S. Cl. 343—7 A **15 Claims**



1. In an energy sensing system, the combination comprising:

a range-azimuth comparator;

an inhibit gate electrically connected to the range-azimuth comparator;

a digital memory circuit electrically connected to the range-azimuth comparator;

a clutter detection counter logic circuit, the output of which is electrically connected to the input of the memory, the output of the inhibit gate being electrically connected to the input of the clutter detection counter logic circuit.

4,067,013
AUTOMATIC THRESHOLDING AND REFERENCE CIRCUIT

Richard M. Smith, Ridgecrest, Calif., assignor to The United States of America as represented by the Navy, Washington, D.C.

Filed Nov. 12, 1976, Ser. No. 741,261
Int. Cl.[2] G01S *9/42, 7/34;* H04B *1/12*
U.S. Cl. 343—7.7 **9 Claims**

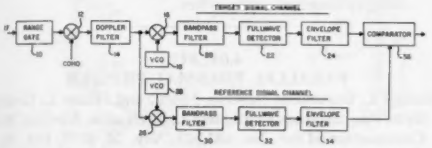
1. An automatic, adaptive-threshold circuit for processing signals received from a pulse Doppler radar comprising:

reception means for receiving a radar return signal from said pulse Doppler radar;

a target channel connected to the output of said reception means, tuned to a first narrow bandwidth, and outputting

a first time replica spectrum of said received output from said reception means;

a reference channel connected to the output of said reception means and in parallel with said target channel, said reference channel tuned to a second narrow bandwidth wider than said first narrow bandwidth and outputting a second time replica spectrum of said received output from said reception means, said second time replica spectrum being coarser than said first time replica spectrum; and

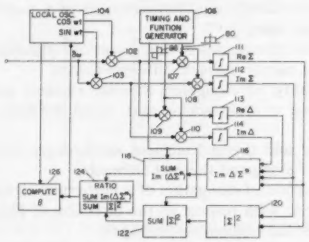


a comparator having a plurality of inputs connected to and receiving the outputs of said target channel and said reference channel, whereby said received radar return signal is processed in parallel fashion by said target and said reference channels, said reference channel output being the automatic, adaptive threshold against which said target channel output is compared in said comparator.

4,067,014
CORRELATION RECEIVER FOR DOPPLER MICROWAVE LANDING SYSTEM

Harold A. Wheeler, Smithtown, and Alfred R. Lopez, Commack, both of N.Y., assignors to Hazeltine Corporation, Greenlawn, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,063
Int. Cl.[2] G01S *5/02*
U.S. Cl. 343—113 DE **8 Claims**



1. Signal processing apparatus, for providing an error signal representative of the average frequency difference between a local oscillator signal and a supplied signal comprising a series of transmissions, each transmission occurring during a predetermined time interval, comprising:

correlation means, responsive to said supplied signal and said local oscillator signal, for developing a complex correlation signal representative of the amplitude and phase of said supplied signal with respect to said local oscillator signal;

first integrating means, responsive to said correlation signal and having a symmetrical frequency response characteristic, for producing complex sum signals representative of the symmetrical integrals of said correlation signal during selected time periods, each comprising at least a portion of one of said predetermined time intervals;

second integrating means, responsive to said correlation signal and having asymmetrical frequency response characteristics for producing complex difference signals representative of the asymmetrical integrals of said correlation signal during said selected time periods;

means, responsive to said sum and difference signals, for developing a first scalar signal representative of the summation of amplitude weighted components of said difference signals over a predetermined number of said time intervals;

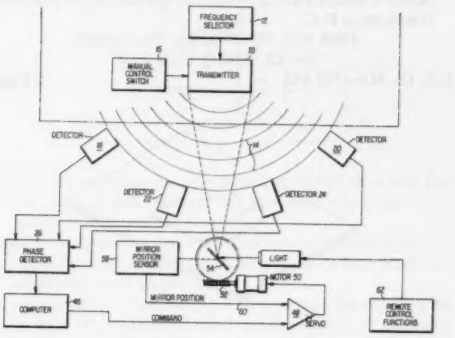
means, responsive to said sum signals, for developing a second scalar signal representative of the summation of the magnitudes of said sum signals over said predetermined number of time intervals;

ratio means, responsive to said first and second scalar signals, for developing said error signal, representative of the average frequency deviation of said supplied signal from said local oscillator signal during said predetermined number of time intervals.

4,067,015
SYSTEM AND METHOD FOR TRACKING A SIGNAL SOURCE

Louis N. Mogavero, Alexandria, Va.; Edwin G. Johnson, Kensington, Md.; John M. Evans, Jr, Gaithersburg, Md., and James S. Albus, College Park, Md., assignors to The United States of America as represented by the National Aeronautics and Space Administration, Washington, D.C.

Filed July 11, 1975, Ser. No. 595,254
Int. Cl.[2] H04B *7/08*
U.S. Cl. 343—225 **4 Claims**



1. A system for monitoring the movements of a performer over the area over which the performer is to move and for tracking the movements with a light beam produced by a spotlight, said system comprising:

at least one movable miniaturized transmitting means, adapted to be carried by a performer, for transmitting an omnidirectional signal capable of being tracked;

at least first and second detector means for sensing said omnidirectional signal and for respectively producing first and second output signals in response thereto, said detector means being remotely spaced from one another at different locations relative to the area over which the performer is to move and being positioned in a predetermined, fixed pattern with respect to the area over which the performer is to move;

phase detector means coupled to detector means for receiving said output signals and for producing an output in accordance with the phase difference between the output signals produced by said first and second detector means, said phase detector means comprising a first channel for receiving said first output signal and including a first multiplying means for multiplying the first and second output signals, and a low pass filter, and a second channel for receiving said second output signal and including a phase shifter, a second multiplying means for multiplying the first signal and the output signal from the phase shifter, and a second low pass filter;

command position signal generating means coupled to said phase detector means for receiving said output from said phase detector and for generating a position command signal in accordance therewith;

servo motor means;

servo network means coupled to said command position signal generating means for receiving said command signal and for controlling said servo motor means in accordance therewith;

movable tracking means coupled to and driven by said servo motor means in response to said command signal for tracking the transmitting means carried by the performer, said tracking means comprising a fixed spotlight for producing a light beam and a rotatable mirror for reflecting said beam so as to track said transmitting means, said rotatable mirror being controlled by said servo motor and positioned to receive said light beam produced by said spotlight; and

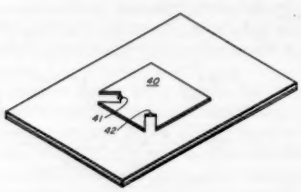
mirror position detector means coupled to said rotatable mirror and to said servo network means for providing tracking error signals to said servo network means so as to control the tracking movement of said mirror.

4,067,016

DUAL NOTCHED/DIAGONALLY FED ELECTRIC MICROSTRIP DIPOLE ANTENNAS

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 10, 1976, Ser. No. 740,692
Int. Cl.[2] H01Q *1/38, 9/28*
U.S. Cl. 343—700 MS **8 Claims**



1. A dual notched/diagonally fed electric microstrip dipole antenna having low physical profile and conformal arraying capability, comprising:

a. a thin ground plane conductor;

b. a thin square radiating element for producing a radiation pattern being spaced from said ground plane;

c. said square radiating element being electrically separated from said ground plane by a dielectric substrate;

d. said square radiating element having a first feed point located along one diagonal line of the square radiating element and a second feed point located along the other diagonal line of the square radiating element, said diagonal lines being normal to one another; said first and second feed points being equidistant from the center point of said square radiating element;

e. said square radiating element having a first notch extending into said square radiating element along said one diagonal line of the square radiating element from the outer edge thereof to said first feed point and having a second notch extending into said square radiating element along said other diagonal line of the square radiating element from the outer edge thereof to said second feed point;

f. the resonant frequency of the antenna being determined primarily by the length of said square radiating element; the width of said first and second notches having a slight effect on the resonant frequency, as the width of the notches is increased the resonant frequency being increased slightly and vice versa;

g. the antenna input impedance being variable to match most practical impedances as said feed points are equidistantly moved along said diagonal lines between the square radiating element center point and edge of the square radiating element;

h. the antenna bandwidth being variable with the width of the square radiating element and the spacing between said square radiating element and said ground plane, said spacing between the square radiating element and the ground plane having somewhat greater effect on the bandwidth than the square radiating element width;

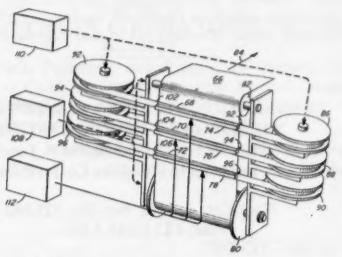
i. said square radiating element being operable to oscillate in two modes of current oscillation, each of said two modes being orthogonal to the other.

4,067,017

PARALLEL THERMAL PRINTER

Michael L. Dertouzos, Newton, Mass., and Huber L. Graham, Bath, Pa., assignors to Michael L. Dertouzos, Newton, Mass.

Continuation of Ser. No. 633,913, Nov. 20, 1975, Pat. No. 3,984,809. This application Sept. 30, 1976, Ser. No. 728,167
Int. Cl.[2] G01D *9/28*
U.S. Cl. 346—46 **5 Claims**



1. A thermal printer comprising:

a. means for continuous advancement of a visual medium receptive web;

b. means for continuous advancement of a plurality of visual medium carrier webs of different colors;

c. a plurality of elongated thermal element assemblages extending entirely across said visual medium receptive web;

d. each of said thermal element assemblages comprising a series of elongated thermal elements;

e. the direction of elongation of said thermal elements being transverse with respect to the direction of elongation of said thermal element assemblages;

f. a plurality of common bus means and a plurality of individual terminal means, one extremity of each of said thermal elements being connected to one each of said bus means, the other extremity of each of said thermal elements being connected to one each of said terminal means, said plurality of bus means serving as electrical grounds and as thermal heat sinks;

g. selection means for selecting certain of said thermal elements;

h. drive means for energizing said certain of said thermal elements; and

i. clock means for recycling said selection means and said drive means.

4,067,018

EXCESSIVE MAGNETIC DEVELOPER DISPLACEMENT SYSTEM

Stephen F. Pond, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

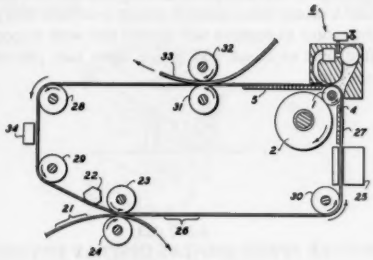
Filed Aug. 27, 1975, Ser. No. 608,357
Int. Cl.[2] G03G *15/08*
U.S. Cl. 346—74.1 **18 Claims**

1. Apparatus for displacing magnetic toner from a member bearing a latent magnetic image and having deposited thereon

magnetic toner in both imagewise configuration and background areas, comprising:

a. means for moving the member; and

b. acceleration means at a toner removal station in the move-



ment path for applying an acceleration to said mwmber only at said station of a magnitude sufficient to displace magnetic toner from background areas but insufficient to displace all of the magnetic toner in imagewise configuration.

4,067,019

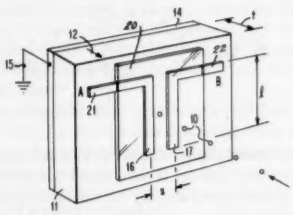
IMPACT POSITION TRANSDUCER FOR INK JET

John Martin Fleischer, and Richard Dwight Holmes, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 14, 1976, Ser. No. 696,101

Int. Cl.[2] G01D *15/18;* **H01V** *7/00*

U.S. Cl. 346—75 **12 Claims**



1. Apparatus for detecting the location of small projectile impact comprising:

a poled piezoelectric member for generating a signal due to mechanical stress produced by impact on a surface thereof by said projectile;

two parallel separated conductors on said surface of said piezoelectric member for receiving said signal; and

means for detecting the relative signal strength due to said mechanical stress on said conductors.

4,067,020

NONINTERRUPT INK TRANSFER SYSTEM FOR INK JET PRINTER

George Arway, River Grove, Ill., assignor to A. B. Dick Company, Chicago, Ill.

Filed Sept. 20, 1976, Ser. No. 724,994

Int. Cl.[2] G01D *15/18*

U.S. Cl. 346—75 **8 Claims**

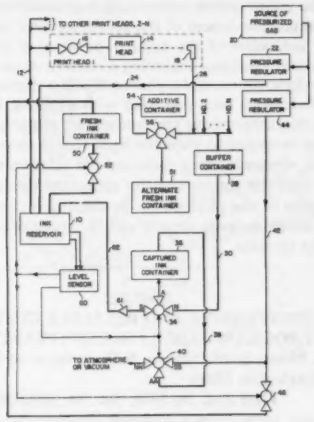
1. An ink jet printing system of the type wherein ink is supplied from a reservoir to a nozzle to be projected thereby as a stream of drops toward a target, some of the drops in said stream being deflected for printing on said target, the remaining ink drops in said stream being captured, the improvement comprising:

means for supplying a pressurized gas,

a first pressure regulator for applying gas at a first pressure from said means to said ink reservoir to thereby cause ink to flow out of said reservoir to said printing head,

a captured ink container,

a first valve means connected to said captured ink container, said first valve having a first position for enabling captured ink to be directed to said captured ink container, and a second position for closing said captured ink container and for directing ink from said captured ink container into said ink reservoir,



means for applying gas at a pressure higher than said first pressure to said captured ink container when said valve means is in its second position,

means for operating said first valve means from its first, to its second position and from its second to its first position,

a container for fresh ink, and

a second valve means having a first position for enabling ink to flow from said fresh ink container to said ink reservoir, and a second position for preventing the flow of fresh ink from said fresh ink container to said ink reservoir.

4,067,021

OPTICAL SCANNING APPARATUS

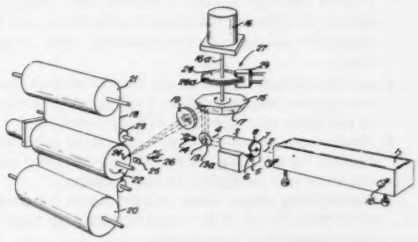
Howard Raymond Baylis, East Grinstead; Roger Alan Edwards, Crawley Down, and David Richard Sweatman Hedgeland, Redhill, all of England, assignors to The Monotype Corporation Limited, England

Filed May 20, 1976, Ser. No. 688,317

Claims priority, application United Kingdom, May 27, 1975, 23090/75

Int. Cl.[2] G01D *15/10, 9/42;* **G02B** *27/17*

U.S. Cl. 346—76 L **16 Claims**



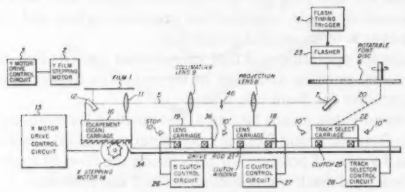
1. In optical scanning apparatus comprising a source of light, a rotatable reflecting element having a plurality of reflective facets which are inclined to the axis of rotation, means for

directing a beam of light derived from the source at said reflecting element in a direction parallel to its axis of rotation to impinge upon successive facets thereof as it is rotated, means for defining a position for a recording element having a surface that requires scanning, means for focussing the beam as reflected by said reflecting element onto said surface, a motor coupled to rotate the reflecting element, so that each facet in turn causes the focussed beam to scan across said surface in one direction, and a drive for moving the recording element substantially perpendicular to said on direction, past said focussed beam, the improvement comprising a generator responsive to the rotational movement of the reflecting element to generate a signal indicative of the angular position of said reflecting element, said generator including a readout device comprising a further light source and a photocell and a shutter comprising a pair of elements each provided with a grating formed by an array of alternate opaque and transparent portions, said photocell being arranged to view the light source through the gratings, said elements being mounted for relative movement in accord with the rotation of the reflecting element, whereby illumination of the photocell is modulated cyclically at a frequency which varies in accord with the speed of rotation of the reflecting element.

4,067,022
INEXPENSIVE AND RELIABLE CUSTOM PROGRAMMABLE PHOTOTYPESETTER

Peter R. Ebner, South Nashua, N.H., assignor to Itek Corporation, Lexington, Mass.

Filed Jan. 26, 1976, Ser. No. 652,024
Int. Cl.[2] B41B *21/20*
U.S. Cl. 354—7 **62 Claims**



1. In a phototypesetter:

a. a character generator for producing images of illuminated characters to be projected along an optical axis upon a photosensitive medium;

b. an *x* positioning motor;

c. a first carrige coupled to said *x* positioning motor, for producing relative motion between said medium and said optical axis for sequentially positioning images of said characters to be typeset across said medium;

d. an elongated drive member coupled to said first carriage;

e. a second carrige having a first lens means coupled thereto for producing a first image of said characters;

f. a third carriage having a second lens means coupled thereto for relaying the image produced by said first lens means for subsequent projection upon said imaging medium;

g. second carriage clutch means associated with said second carriage for coupling and decoupling said second carriage to and from said elongated driving member;

h. third carriage clutch means associated with said third carriage for coupling and decoupling said third carriage to and from said elongated driving member;

i. *x* positioning motor drive control means for causing said positioning motor to drive said first carriage together with said elongated driving member;

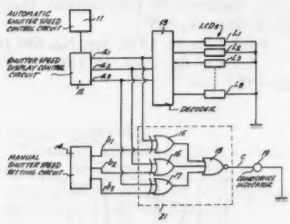
j. second carriage positioning control means for actuating said second carriage clutch for selectively coupling said second carriage to said elongated driving member and for causing said *x* motor drive control circuit to actuate said *x* motor to position said second carriage at a position along said optical axis to produce an image of a selected size; and

k. third carriage positioning control means for actuating said third carriage clutch for selectively coupling said third carriage to said elongated driving member and for causing said *x* motor drive control circuit to actuate said positioning motor to position said second lens with respect to said first lens to focus said image upon said photosensitive medium.

4,067,023
SHUTTER SPEED DIGITAL DISPLAY DEVICE FOR CAMERAS

Naoyuki Uno, Urawa; Tetsuji Shono, Saitama; Fumio Urano, Omiya; Kunio Mita, Kamifukuoka; Masahiro Kawasaki, and Chiharu Mori, both of Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1975, Ser. No. 624,996
Claims priority, application Japan, Nov. 5, 1974, 49-133947[U]
Int. Cl.[2] G03B *17/18*
U.S. Cl. 354—23 D **10 Claims**



1. A shutter speed digital display device for cameras having both automatic and manual shutter speed controls comprising:

a. digital shutter speed display means for displaying shutter speed comprising:

1. a display control circuit connected to said automatic shutter speed control of said camera for generating an output representing the shutter speed determined by said automatic shutter speed control of said camera; and,

2. a liquid crystal display means connected to the output of said display control circuit in a manner such that a particular shutter speed digital display is created when a particular output of said display control circuit occurs;

b. a manual shutter speed setting circuit for generating an output representing the manual setting of the shutter speed of said camera;

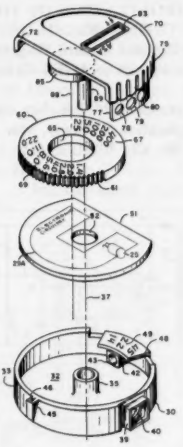
c. comparator means connected to said display control circuit and to said manual shutter speed setting circuit for comparing a signal related to the digital shutter speed displayed by said liquid crystal display means with the output of said manual shutter speed setting circuit and generating an output related to whether or not there is coincidence between said shutter speed display and said output of said manual shutter speed setting circuit; and,

d. a coincidence indicator connected to the output of said comparator means for indicating when said comparator means senses coincidence between said shutter speed digital display and the output of said manual shutter speed setting circuit.

4,067,024
CALCULATOR

Peter T. Quinn, Littleton, Colo., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Mar. 11, 1976, Ser. No. 665,992
Int. Cl.[2] G03B 7/08; G06C 3/00
U.S. Cl. 354—23 R 11 Claims



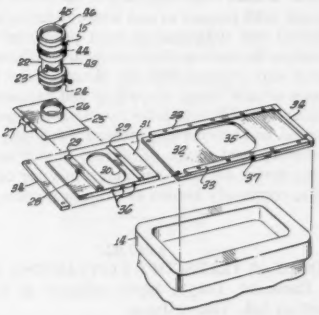
1. Apparatus comprising:
a first member including a first indicia bearing portion and a first observing portion;
a second member including a second indicia bearing portion and a third indicia bearing portion;
a third member including a second observing portion;
means mounting said second member on said third member for rotation about a first axis with the second observing portion cooperating with the second indicia to provide a first indication; and
means mounting said third member on said first member for rotation about a second axis displaced from the first axis with the second observing portion cooperating with the first indicia to provide a second indication and with the first observing portion cooperating with the third indicia to provide a third indication.

4,067,025
SELF DEVELOPING CAMERA FOR USE IN MACROPHOTOGRAPHY AND ENDOSCOPIC PATHOLOGY

Otto T. Nebel, Solana Beach; Louis J. Trujillo, and Carl C. Russell, both of San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 3, 1976, Ser. No. 682,815
Int. Cl.[2] G03B 15/14
U.S. Cl. 354—62 5 Claims

1. An endoscopic photographic system for examining and recording the appearance of body cavities comprising in combination:
endoscopic optical means for insertion at a plurality of predetermined locations within a body cavity;
light conducting means connected to said endoscopic optical means for providing a light conducting path therefrom to the exterior of the body cavity;
lens and shutter means attached to said light conducting means for formation and timed transmission of an optical image of the view of each predetermined location within the body cavity transmitted via said endoscopic optical means and said light conducting means;
a camera back for positioning a single self developing film plate to receive each of said optical images formed and transmitted by said lens and shutter means; and
movable lens mount means positioned between said lens and shutter means and said camera back for producing a plurality of photographic images on said single film plate, each of said photographic images corresponding to one of said predetermined locations within the body cavity, wherein said movable lens mount means includes:
plate means attached to said camera back for establishing a light-tight closure therefor;
first retaining means mounted about the peripherial edge of said plate means for providing edge retention thereon;

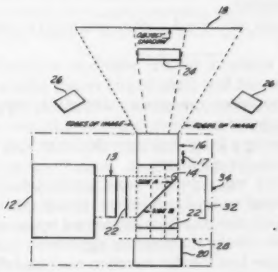


an aperture centrally located in said plate means and surrounded by said first retaining means;
movable first slide means having an aperture therein and held in sliding engagement with said plate means by cooperative edge retention by said first retaining means;
second retaining means mounted on said first slide means and said second retaining means surrounding the aperture in said first slide means for providing edge retention thereon; and
movable second slide means having an aperture therein and held in sliding engagement with said first slide means by cooperative edge retention by said second retaining means.

4,067,026
FRONT PROJECTION SYSTEM EMBODYING A SINGLE LENS

George Pappanikolaou, 621 90th St., Brooklyn, N.Y. 11228

Filed July 19, 1976, Ser. No. 706,780
Int. Cl.[2] G03B 29/00
U.S. Cl. 354—77 10 Claims



1. An improved front projection system comprising: an image projecting device having a light source and an image projecting plane where an image producing device is located, means for focusing said light source, an image capturing device

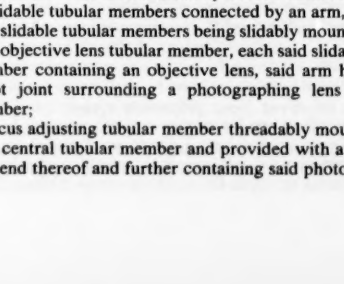
having an image capturing plane where an image capturing medium is located, a generally semi-reflective/semi-transparent element, and a common lens having front and rear surfaces for use with both said image projecting device and said image capturing device; said image projecting and capturing devices, said semi-reflective/semi-transparent element and said common lens being perpendicular to a mounting surface with the axis of said projecting and capturing devices and said common lens coinciding in a common plane and intersecting approximately at the center of said semi-reflective/semi-transparent element; said semi-reflective/semi-transparent element being disposed behind said rear surface of said common lens at an angle of about 45° with respect thereto; the planes of said image projecting and capturing devices being generally perpendicular to each other and each of the planes being at about a 45° angle with respect to said semi-reflective/semi-transparent element and with said element positioned so that light projected on the surface of said element is reflected to said rear surface of said common lens; the distance from the centers of the planes of said image projecting and capturing devices to the center of said semi-reflective/semi-transparent element being equal; and lens moving means for focusing said common lens; whereby said image projecting device and said image capturing device are used simultaneously for composite photography, commonly known as front projection.

4,067,027

BINOCULAR TELESCOPE CONTAINING A CAMERA

Shogo Yamazaki, Tokyo, Japan, assignor to Asia American Industries Ltd., Tokyo, Japan

Filed Aug. 31, 1976, Ser. No. 719,160
Int. Cl.² G03B *17/48;* G02B *21/00*
U.S. Cl. 354—79 **2 Claims**



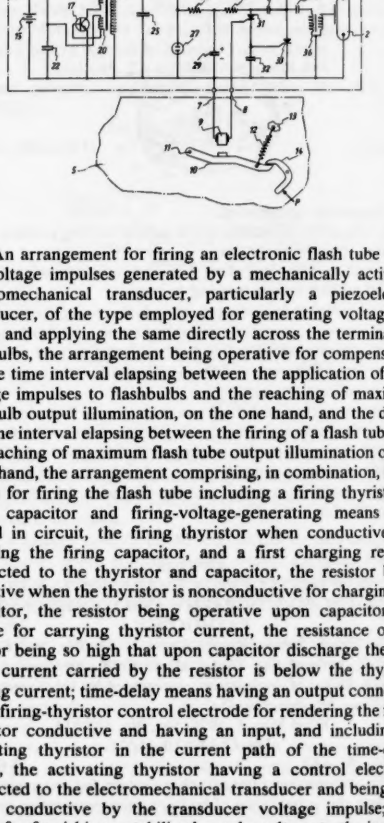
1. A binocular telescope containing a camera comprising:
a. a central tubular member;
b. a pair of rotary tubular members, each having first and second faces, respectively, said rotary tubular members being pivotally mounted to be rotatable about said central tubular member;
c. prism means contained within said rotary tubular members;
d. a pair of eyepiece tubular members protruding respectively from said first faces of said rotary tubular members;
e. a pair of eyepieces respectively threadably secured to said eyepiece tubular members;
f. a finder having a frame line provided in at least one of said eyepiece tubular members;
g. an objective lens tubular member protruding from said second face of each of said rotary tubular members, a pair of slidable tubular members connected by an arm, each of said slidable tubular members being slidably mounted on a said objective lens tubular member, each said slidable tube member containing an objective lens, said arm having a pivot joint surrounding a photographing lens tubular member;
h. a focus adjusting tubular member threadably mounted on said central tubular member and provided with a knob at one end thereof and further containing said photographic lens tubular member, said photographic lens tubular member containing photographic lenses; and
i. a camera body fixed to said central tubular member on the side thereof to receive images from said photographic lenses.

4,067,028

PROPER SYNCHRONIZATION OF THE FIRING OF ELECTRONIC FLASH UNITS

Peter Lermann, Narring, and Eduard Wagensonner, Aschheim, both of Germany, assignors to AGFA-Gevaert, AG, Leverkusen, Germany

Filed Mar. 15, 1976, Ser. No. 666,658
Claims priority, application Germany, Mar. 27, 1975, 2513812
Int. Cl.² G03B *15/03*
U.S. Cl. 354—141 **7 Claims**



1. An arrangement for firing an electronic flash tube using the voltage impulses generated by a mechanically activated electromechanical transducer, particularly a piezoelectric transducer, of the type employed for generating voltage impulses and applying the same directly across the terminals of flashbulbs, the arrangement being operative for compensating for the time interval elapsing between the application of such voltage impulses to flashbulbs and the reaching of maximum flashbulb output illumination, on the one hand, and the different time interval elapsing between the firing of a flash tube and the reaching of maximum flash tube output illumination on the other hand, the arrangement comprising, in combination, firing means for firing the flash tube including a firing thyristor, a firing capacitor and firing-voltage-generating means connected in circuit, the firing thyristor when conductive discharging the firing capacitor, and a first charging resistor connected to the thyristor and capacitor, the resistor being operative when the thyristor is nonconductive for charging the capacitor, the resistor being operative upon capacitor discharge for carrying thyristor current, the resistance of the resistor being so high that upon capacitor discharge the thyristor current carried by the resistor is below the thyristor holding current; time-delay means having an output connected to the firing-thyristor control electrode for rendering the firing thyristor conductive and having an input, and including an activating thyristor in the current path of the time-delay means, the activating thyristor having a control electrode connected to the electromechanical transducer and being rendered conductive by the transducer voltage impulse; and means for furnishing a stabilized supply voltage to the input of the time-delay means including a storage capacitor connected to the input of the time-delay means and operative for discharging through the current path of the time-delay means when the activating thyristor becomes conductive, a second charging resistor connected to the storage capacitor and the activating thyristor, the second charging resistor being operative for charging the storage capacitor when the activating thyristor is non-conductive, the second charging resistor being operative upon discharge of the storage capacitor for carrying activating-thyristor current, the resistance of the second charging resistor being so high that upon storage-capacitor dis-

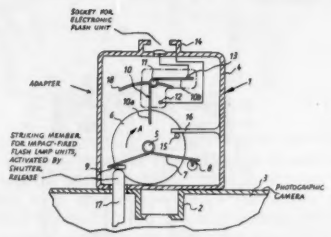
charge the activating-thyristor current carried by the second charging resistor is below the activating-thyristor holding current, and a voltage-stabilizing means connected to the storage capacitor and to the input of the time-delay means and operative for causing the voltage applied from the storage capacitor to the input of the time-delay means to be the same each time the activating thyristor is rendered conductive.

4,067,029

ARRANGEMENT FOR THE DELAYED FIRING OF AN ELECTRONIC FLASH UNIT

Rainer Vesper, and Dieter Engelsmann, both of Unterhaching, Germany, assignors to AGFA-Gevaert, AG, Leverkusen, Germany

Filed Mar. 10, 1975, Ser. No. 557,075
Claims priority, application Germany, Mar. 12, 1974, 2411845
Int. Cl.[2] G03B *15/05*
U.S. Cl. 354—137 **8 Claims**


SOCKET FOR ELECTRONIC FLASH UNIT
ADAPTER
STRIKING MEMBER FOR IMPACT-FIRED FLASH LAMP UNITS, ACTIVATED BY SHUTTER RELEASE
PHOTOGRAPHIC CAMERA

1. An adapter for effecting delayed firing of an electronic flash unit in response to activation of a photographic camera of the type provided with a striking member which otherwise serves to effect firing of impact-fired flash lamp units, comprising, in combination, a housing provided with mounting means for mounting said housing on such a camera with a predetermined position relative to the striking member of such camera; an inertial body mounted in said housing for swinging movement about a predetermined axis; biasing means urging said inertial body in a predetermined direction; and snchronizing switch means activatable by said body when the latter assumes a predetermined activating position for effecting firing of an electronic flash unit, said inertial body being so located relative to said mounting means as to be set into motion against the force of said biasing means by the striking force of a striking member on a camera on which the adapter is mounted to describe a predetermined path of movement in which said inertial body reaches said activating position, wherein said inertial body is provided with an engaging portion, wherein said switch means comprises a first and a second contact and an electrically conductive torsion spring mounted on said housing and having a first leg positioned in the path of movement of said inertial body to be moved by the latter into electrical engagement with said first contat and a second leg electrically connected to said second contact.

4,067,030

CAMERA FOCUSSING AID

Yoshio Kuramoto, Toyonaka; Toshinori Imura, and Yoshiiku Kikukawa, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 20, 1976, Ser. No. 650,821
Claims priority, application Japan, Jan. 24, 1975, 50-10869; Mar. 24, 1975, 50-34542; Mar. 29, 1975, 50-37402
Int. Cl.[2] G03B *15/03, 3/00*
U.S. Cl. 354—139 **30 Claims**

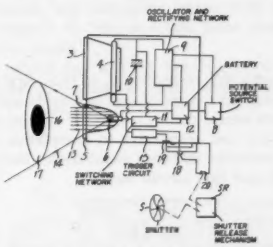
1. An auxiliary illumination device for use with a photographic camera which includes a shutter and a view-finder having means for visibly indicating the focus condition of an image of a photographic object, and for use with a flash device which includes an electronic flash tube, a capacitor, means for charging said capacitor and a trigger circuit for discharging said capacitor for firing said electronic flash tube in synchronism with the opening of said shutter, said auxiliary illumination device comprising:

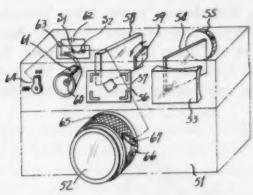
an illumination lamp for projecting light on a part of the photographic object;

a power supply circuit for supplying electric power to said illumination lamp; and

means for permitting and interrupting the power supply to said illumination lamp respectively upon accomplishment of the charging and discharging of said capacitor.

13. An auxiliary illumination device for use with a photographic camera which includes a shutter, a focus adjusting member for adjusting focus condition of an image of a photo-





graphic object, and a view-finder having means for visibly indicating the focus condition of said image, said illumination device comprising:

an illumination lamp for projecting light on a part of the photographic object;

a power supplying circuit for supplying electric power to said illumination lamp;

switching means disposed in said power supplying circuit and being normally non-conductive for interrupting the power supply to said illumination lamp; and

manual means operable for rendering said switching means conductive, said manual means being disposed at a position in which the same is operable together with said focus adjusting member while the latter is being operated.

4,067,031

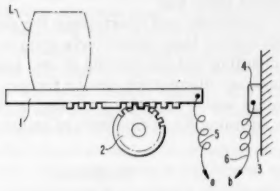
DEVICE FOR LIMITING THE EXTENT OF MOVEMENT OF A MOVEABLE MEMBER IN A MOTOR OPERATED FOCUSSING DEVICE IN A CAMERA

Shigeo Enomoto, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 25, 1976, Ser. No. 717,799
Claims priority, application Japan, Sept. 16, 1975, 50-111946
Int. Cl.[2] G03B *3/10*
U.S. Cl. 354—195 **4 Claims**

1. A control circuit for cutting the supply of current to a motor when a moveable member, continuously moveable by said motor, comes to a stop abutting relation with a stop member, comprising first and second circuit means for selectively applying current to said motor in first and second directions to cause said motor to rotate in first and second directions, re-

spectively, to move said moveable member in first and second directions, respectively, said moveable member moving toward said stop member in said first direction, said control circuit further comprising at least the abutting portions of said moveable member and stop member, at least said portions being electrically conductive, a pair of electric lead wires



electrically connected, respectively, at their first ends to the electrically conductive parts of said moveable and stop members, and switch means connected to the second ends of said pair of lead wires and responsive to completion of a circuit between said moveable and stop members for interrupting the current flow in said first circuit means.

4,067,032

STRUCTURE OF CAMERA BODY

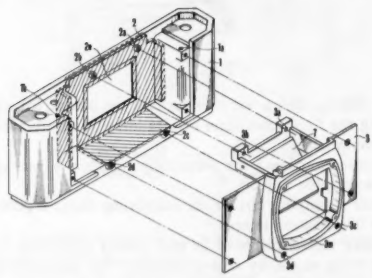
Ryoichi Yoshikawa, Kawasaki; Teruhisa Oda, Sagamihara; Kunio Tanaka, Yokohama; Yukio Iura, Yokosuka; Tadahide Fukushima, Tokyo, and Hiroshi Aizawa, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 30, 1975, Ser. No. 591,324

Claims priority, application Japan, July 5, 1974, 49-77158

Int. Cl.[2] G03B *17/00*

U.S. Cl. 354—288 **3 Claims**



1. A single lens reflex camera body comprising a molded plastic camera body including a rear wall, a front wall, and a bottom wall and side walls extending between said rear and front walls, a metal block inserted in said molded plastic camera body during the molding thereof, said metal block comprising a main section, a first section extending angularly from said main section and a pair of spaced second bent sections extending angularly from said main section, said first bent section being inserted in the bottom wall of said camera body and having a first mounting part provided on the edge of said first bent section spaced from said main section, said main section being inserted in said rear wall of said camera body and having a second mounting part adjacent the edge thereof spaced from said first and second bent sections, said main section having an aperture therethrough for determining the size of pictures and also having rail faces thereon for guiding film, a front plate unit made of a metallic material and having a photographic lens mounting seat and a mirror mounting parts, the front plate unit having a third mounting part located at the side of said mounting seat and aligned with said first mounting part and also having a fourth mounting part located at the mirror mounting part and aligned with said second mounting part, and connecting means for securing said front plate unit directly to said metal block inserted in said molded plastic camera body, said connecting means connecting said first mounting part to said third mounting part and said second mounting part to said fourth mounting part for ensuring the precision and strength of the camera body.

4,067,033

CORRECTING DEVICE FOR CAMERAS WITH AUTOMATIC EXPOSURE CONTROL

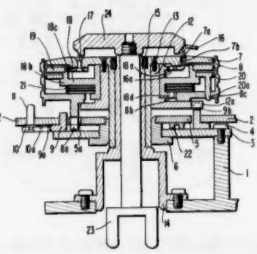
Fumio Urano, Omiya, and Junji Umetsu, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 11, 1976, Ser. No. 695,299

Claims priority, application Japan, June 23, 1975, 50-87063[U]

Int. Cl.[2] G03B *17/00*

U.S. Cl. 354—289 **4 Claims**



1. In a camera of the type having a variable impedance, the value of which constitutes one of the inputs of an exposure control circuit, a manually operated operating ring **8** for altering the value of said variable impedance, and a film sensitivity indicating ring **20** rotatably fixed to said operating ring to rotate therewith, the improvement comprising,

a. a first exposure correction indicating ring **19**,

b. a second exposure correction indicating ring **7**,

c. first interlocking means (**18** and **8**) for rotatably interlocking said operating ring and said first exposure correction indicating ring, said first interlocking means being manually disengagable to permit said operating ring to be rotated independently of said first exposure correction indicating ring,

d. second interlocking means (**16** and **18**) for rotatably interlocking said first and second exposure correction indicating rings, said second interlocking means being manually disengagable to permit said first exposure correction indicating ring to be rotated independently of said second exposure correction indicating ring, and

e. third manually disengagable locking means (**9**, **10**, and **11**) for preventing rotation of said second exposure correction indicating ring, whereby selective operation of said manually controlled interlocking means plus rotation of said operating ring causes selective rotation of one, two and three of said indicating rings.

4,067,034

PHOTOGRAPHIC DEVELOPING MACHINE

Wolfgang Kwiatkowski, Unterhaching, Germany, assignor to AGFA-Gevaert, AG, Leverkusen, Germany

Filed Oct. 1, 1976, Ser. No. 728,832

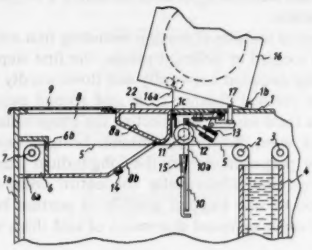
Claims priority, application Germany, Oct. 3, 1975, 2544322

Int. Cl.[2] G03D *13/06*

U.S. Cl. 354—310 **10 Claims**

1. In an apparatus for processing photographic strips, in combination, a plurality of processing stations; an endless pull strip extending through the successive processing stations; a

light lock compartment located in the path of travel of the pull strip and having an open side opening into the interior of the apparatus; a flap structure mounted for movement between a closed position in which the flap structure closes off the open side of the light lock compartment and an opened position; a holding socket on the processing apparatus for holding a light-tight cassette containing photographic strip material to be processed, the holding socket being provided with an infeed passage extending into the interior of the apparatus down-path of the light lock compartment, the flap structure being so



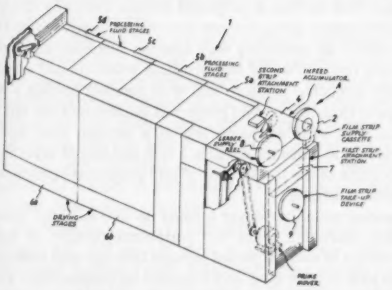
positioned relative to the infeedpassage that the path of motion of the flap structure from the opened to the closed positions thereof crosses the path of infeed travel of the leading end of a photographic strip extending through the infeed passage, whereby when the leading end of a strip is being fed through the infeed passage, displacement of the flap structure to closed position both seals off the light lock compartment from the interior of the apparatus and moves such leading end into the light lock compartment so that the leading end can be secured to the endless pull strip.

4,067,035

DAYLIGHT DEVELOPING MACHINE

Gerald Plursch, Munich, and Jurgen Leuchter, Tutzing, both of Germany, assignors to AGFA-Gevaert, AG, Leverkusen, Germany

Filed June 18, 1976, Ser. No. 697,573
Claims priority, application Germany, June 20, 1975, 2527561
Int. Cl.[2] G03D *3/13*
U.S. Cl. 354—313 **14 Claims**



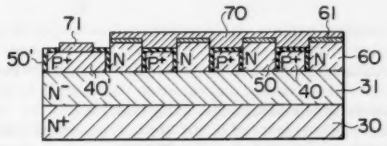
1. In a continuously operating developing machine for film strips of the type comprised of at least one processing fluid stage, at least one drying stage located downstream of the processing fluid stage and a discharge station located downstream of the drying stage, with film strips being guided connected one to the other through said stages and to said discharge station along a predetermined path, in combination, a first strip attachment station upstream of said stages provided with means for attaching the leading end of a new strip to the trailing end of a strip section which has already entered said path, an infeed accumulator located intermediate said first attachment station and said stages and provided with means for accumulating a length of strip being fed into said path so that strip can continue to be fed into said path during the detention of the trailing end of the strip in said accumulator at said first attachment station for attachment purposes, and a second strip attachment station intermediate said accumulator and said stages provided with means for attaching to the trailing end of a broken strip section leaving said accumulator the leading end of a leader strip so that as the trailing end of the broken strip section enters said path the leader strip will enter thereafter.

4,067,036

JUNCTION FIELD EFFECT TRANSISTOR OF VERTICAL TYPE

Takashi Yoshida, and Katsuhiko Ishida, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 4, 1976, Ser. No. 711,641
Claims priority, application Japan, Aug. 9, 1975, 50-96843
Int. Cl.[2] H01L *29/80, 29/78*
U.S. Cl. 357—22 **6 Claims**



1. A junction field effect transistor of a vertical type comprising:

a drain region having a first conductivity type;

a gate region having a second conductivity type opposite to said first type, said gate region including spaced branches formed by a selective growth method on a top surface of the drain region to define top and side surfaces of the branches;

an insulating layer covering the top surfaces and at least a portion of the side surfaces of said branches; and

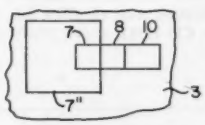
source regions formed by a growth of the drain region on those portions on the top surface of the drain region not covered by the spaced branches and said insulating layer.

4,067,037

TRANSISTOR HAVING HIGH F_t AT LOW CURRENTS

Paul Greiff, Wayland, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 12, 1976, Ser. No. 676,019
Int. Cl.[2] H01L *29/72, 27/02, 27/12*
U.S. Cl. 357—34 **3 Claims**



1. A transistor having high f_T at low collector current, and a low rate of falloff at high collector current comprising

a collector,

a base having its minimum dimension no greater than 0.1 mil contained in said collector, said base having silicon dioxide walls forming the boundary of its periphery,

an emitter on one end of said base,

said emitter having a dimension along the maximum dimension of said base no greater than 0.1 mil.

said emitter having one edge and its bottom area in contact

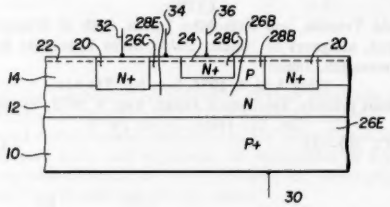
with said base and its remaining three edges in contact with said base silicon dioxide walls,

a base contact region on said base separated from said emitter.

4,067,038
SUBSTRATE FED LOGIC AND METHOD OF FABRICATION

Nicolaas W. Van Vonno, Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Dec. 22, 1976, Ser. No. 753,027
Int. Cl.[2] H01L *27/02, 29/34*
U.S. Cl. 357—46 **4 Claims**



1. An integrated circuit having a pair of transistors comprising:

a substrate of a first conductivity type;

a first epitaxial layer of conductivity type opposite said first conductivity type on said substrate;

a second epitaxial layer on said first epitaxial layer of said first conductivity;

a high impurity concentration of said first conductivity type forming the surface of said second epitaxial layer;

the remainder of said second epitaxial layer having a substantially linear gradient of impurity concentration decreasing from the boundary with said first epitaxial layer to the boundary with the said high impurity concentration surface;

a ring of said opposite conductivity type extending through said second layer and partially into said first layer;

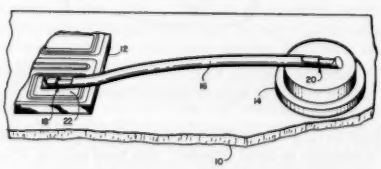
a diffused region of said opposite conductivity type in said surface of said second epitaxial layer within said ring; and

wherein said substrate, first epitaxial layer and said second epitaxial layer are the emitter, base and collector, respectively, of one of said transistors and said first epitaxial layer, second epitaxial layer and said diffused region are the emitter, base, and collector of the other transistor.

4,067,039
ULTRASONIC BONDING HEAD

Stanley Gaicki, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 558,745, March 17, 1975, abandoned. This application Aug. 16, 1976, Ser. No. 714,728
Int. Cl.[2] H01L *23/48, 29/40, 29/44*
U.S. Cl. 357—65 **2 Claims**



1. A semiconductor structure comprising;

a. a substrate,

b. said substrate further including at least one first electrically conductive terminal region and a separated semiconductor chip having at least one second electrically conductive terminal region,

c. a substantially thick wire attached between said first and second terminal regions, said wire having a diameter substantially in the range of **8-25** mils,

d. said wire being attached at each of its ends to said first and second conductive terminal regions, respectively, by first and second metallurgical bonds,

e. each end of said wire including a deformed portion connected to said first and second metallurgical bonds,

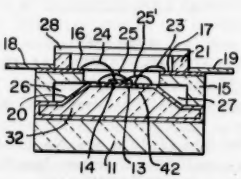
f. each of said deformed portions including a stepped multilevel portion,

g. said stepped multilevel portion including first and second surfaces located at different planes, the first stepped surface being disposed outwardly and downwardly a predetermined vertical distance from said second stepped surface by a third surface intersecting the longitudinal axis of said thick wire, the vertical distance being measured substantially perpendicular to the longitudinal axis of said thick wire and substantially the entire cross sectional dimension of said stepped multi-level portion being less than the cross-sectional dimension of said thick wire.

4,067,040
SEMICONDUCTOR DEVICE

Naobumi Tsuzuki; Shinzo Anazawa, and Shozo Noguchi, all of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Dec. 9, 1976, Ser. No. 749,114
Claims priority, application Japan, Dec. 12, 1975, 50-147398
Int. Cl.[2] H01L *23/48, 23/02, 39/02*
U.S. Cl. 357—74 **12 Claims**



1. A semiconductor device comprising an insulator substrate having a first surface, a projected portion centrally located on said first surface, and a bottom face on the opposite side to said first surface; an insulating wall member mechanically coupled with said first surface of said insulator substrate and surrounding said projected portion, said wall member having a height not lower than that of said projected portion and the thickness of said wall member being less at a portion near said first surface that at a distant portion; a first metallized layer formed on a portion of the top surface of said projected portion of said insulator substrate;

a second metallized layer formed on said insulator substrate and extending from the peripheral portion of the top surface of said projected portion through said first surface to said bottom face, and a second metallized layer passing under said insulating wall member at said first surface;

a semiconductor element having a plurality of electrodes and disposed on said first metallized layer on said projected portion;

means for electrically connecting an electrode of said semiconductor element to said second metallized layer;

at least a third metallized layer formed on the upper end surface of said insulating wall member;

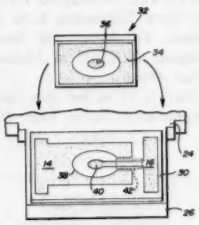
means for electrically connecting another electrode of said semiconductor element to said third metallized layer; and

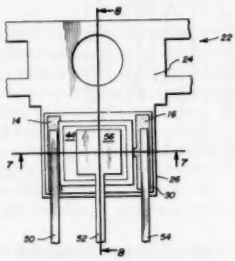
means coupled with said insulating wall member for hermetically sealing said semiconductor element.

4,067,041
SEMICONDUCTOR DEVICE PACKAGE AND METHOD OF MAKING SAME

Jearld L. Hutson, P.O. Box 34235, Dallas, Tex. 75234

Filed Sept. 29, 1975, Ser. No. 617,443
Int. Cl.[2] H01L *23/48, 39/02, 23/02*
U.S. Cl. 357—80 14 Claims



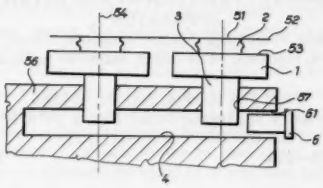


1. A semiconductor device package comprising:
a metal heat sink support member,
a ceramic electrical insulating body bonded on a first side to said support member,
first and second spaced apart interdigitated conductive patterns formed on a second side of said ceramic body,
a semiconductor switching device having first and second terminal patterns formed on one side and a third terminal pattern on the other side, said switching device being bonded on said one side to said interdigitated conductive patterns with said first and second terminal patterns respectively bonded to and directly contacting said first and second conductive patterns,
said first conductive pattern including a first lead contact site formed on said second side of said ceramic body and extending beyond a side of said switching device bonded to said conductive patterns and said second conductive pattern including a second lead contact site formed on said second side of said ceramic body and extending beyond a side of said switching device bonded to said conductive patterns,
a first lead bonded to said first lead contact site and a second lead bonded to said second lead contact site, such that said switching device is isolated from mechanical stresses imposed on said leads, and
a third lead connected to said third terminal pattern of said switching device and extending from said third terminal outwardly from said ceramic body.

4,067,042
HEAT SINK MECHANISM HYDRAULICALLY PROPELLED INTO CONTACT WITH SEMICONDUCTOR DEVICES

Petr Novak; Michal Pellant, and Pavel Reichel, all of Prague, Czechoslovakia, assignors to CKD Praha, oborovy podnik, Prague, Czechoslovakia

Filed Sept. 8, 1976, Ser. No. 721,377
Claims priority, application Czechoslovakia, Sept. 8, 1975, 6085/75
Int. Cl.[2] H01L *25/04, 23/48, 29/40*
U.S. Cl. 357—82 8 Claims

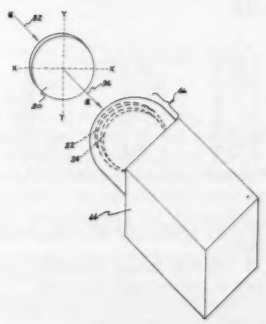


1. In an apparatus for simultaneously cooling a plurality of planar semiconductor devices, a common chamber containing a pressurized hydraulically compressible medium and having a plurality of aligned first openings in a bounary wall thereof, a plurality of parallel elongated rods individually extending outwardly from and slidably mounted within the respective first openings, the inner ends of the rods being in direct fluid pressure communication with the compressible medium, a plurality of heat sinks individually associated with the rods and having first and second opposed surfaces, the first surfaces of the heat sinks being engageable with corresponding surfaces of the respective semiconductive devices, means for individually and rigidly coupling the outer end of each rod to the second surface of the associated heat sink so that each resulting rod-heat sink assembly constitutes a rigid piston acted upon with the same pressure by the compressible medium, and means coupled to the interior of the chamber for varying the hydraulic pressure of the compressible medium within the chamber.

4,067,043
OPTICAL CONVERSION METHOD

William E. Perry, LaPorte, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 21, 1976, Ser. No. 651,007
Int. Cl.[2] H04N *9/04*
U.S. Cl. 358—55 5 Claims



5. The method of switching a television system between a

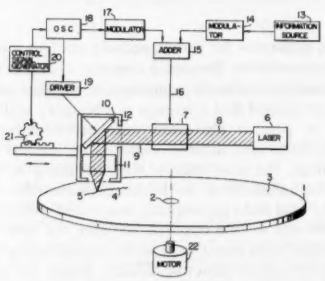
color mode and a black-and-white mode said television system having an optical pickup comprising an electrooptic device located between crossed polarizing devices comprising a first and second polarizing means all positioned along a common optical axis and capable of producing sequential color light signals, comprising the steps of converting said television system to said color mode by placing said first polarizing means along said optical path of said optical signal pickup, and converting said television system to said black-and-white mode by removing said first polarizer from said optical path of said optical signal pickup.

4,067,044

INFORMATION RECORDING AND RETRIEVAL APPARATUS

Takesi Maeda, Kokubunji; Mahito Kohmoto, Tokyo, and Seiji Yonezawa, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 3, 1976, Ser. No. 654,966
Claims priority, application Japan, Feb. 5, 1975, 50-14401
Int. Cl.[2] H04N *5/76*; G11B *21/08*
U.S. Cl. 358—128 **20 Claims**



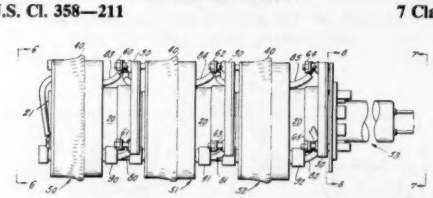
11. A rotary recording medium comprising a recording surface having an information signal and a standard signal recorded in superposed relation on a plurality of information tracks wobbling along concentric circles or a spiral line, said standard signal, at a given track, having a frequency varying depending on the recorded position of said track, wherein the frequency of track wobbling is equal to and synchronized with the frequency of the standard signal.

4,067,045

LOW LIGHT LEVEL CAMERA WITH PARALLEL-CONNECTED SLIDABLY MOUNTED INTENSIFIER ASSEMBLIES

John K. Provost, Babylon, and Charles Lien, Huntington, both of N.Y., assignors to Venus Scientific Inc., Farmingdale, N.Y.

Filed Sept. 28, 1976, Ser. No. 727,527
Int. Cl.[2] H04N *5/30*
U.S. Cl. 358—211 **7 Claims**



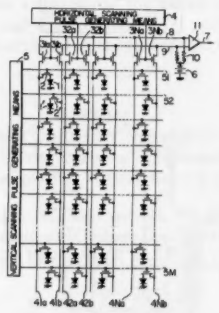
1. A low level light camera comprising, in combination:
a support frame;
a plurality of identical image intensifier assemblies each having a pair of high-voltage terminals;
a vidicon tube optically coupled to and axially aligned with said image intensifier assemblies;
a high-voltage power supply having an output voltage substantially equal to the required voltage for operating any one of said image intensifier assemblies;
connecting means connecting said plurality of identical image intensifier assemblies and said vidicon tube to said support frame;
and means connecting each of said pair of high-voltage terminals in parallel with one another and to said output voltage of said high-voltage power supply.

4,067,046

SOLID STATE IMAGING DEVICE

Hirokuni Nakatani; Toru Takamura, both of Takatsuki; Yoshimitsu Hiroshima, Hirakata, and Susumu Hashimoto, Katano, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Mar. 1, 1976, Ser. No. 662,337
Claims priority, application Japan, Mar. 10, 1975, 50-29373
Int. Cl.[2] H04N *5/30*
U.S. Cl. 358—213 **6 Claims**



1. A solid state imaging device comprising a plurality of photo-electric transducing means arranged in rows and columns, each of said transducing means including a photo-sensitive device and a vertical switching device having a first electrode connected to one terminal of said photo-sensitive device, a second electrode and a control electrode, the control electrodes of the vertical switching devices in each row being connected in common; a plurality of pairs of horizontal switching devices, one pair being provided for each column, each horizontal switching device having a first electrode, a second electrode and a control electrode, the first electrode of one of said pair of horizontal switching devices being connected in common with the second electrodes of the vertical switching devices in the odd rows of its corresponding column and the first electrode of the other of said pair of horizontal switching devices being connected in common with the second electrodes of the vertical switching devices in the even rows of said corresponding column, the control electrodes of the horizontal switching device in each pair being connected together; a differential amplifier having a first input terminal connected in common to the second electrodes of one of the horizontal switching devices in each pair and a second input terminal connected in common to the second electrodes of the other of the horizontal switching devices in each pair; and first and second load resistors connected between the first and second input terminals of said differential amplifier, a power supply being connected between the junction of said resistors and the other terminals of said photo-sensitive device;
whereby, only noise components are derived from one of the horizontal switching devices in each pair and both noise and signal components in proportion to the quantity of light incident on a corresponding photo-sensitive device are derived from the other of said pair of horizontal switching device when scanning pulses are supplied sequentially to the control electrodes thereof, thereby ob-

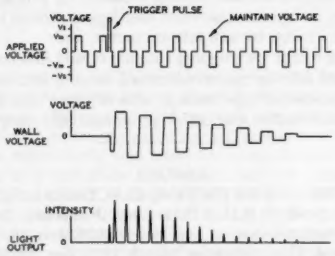
taining only said signal components from the output of said differential amplifier.

4,067,047

CIRCUIT AND METHOD FOR GENERATING GRAY SCALE IN GASEOUS DISCHARGE PANELS

William H. Ryan, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 29, 1976, Ser. No. 671,163
Int. Cl.[2] H04N *5/66*; H05B *41/00*
U.S. Cl. 358—240 **20 Claims**



12. A method of obtaining variable light intensity from a gas discharge display/memory cell comprising the steps of:

sampling an analog video signal to generate a sample having a potential proportional to the magnitude of said video signal when said sample was taken;

storing said sample;

generating a trigger signal from said stored sample, said trigger signal having a wave form with at least one dimension proportional to the potential of said sample so as to cause a gas discharge proportional to the light intensity desired;

applying said trigger signal across said cell; and

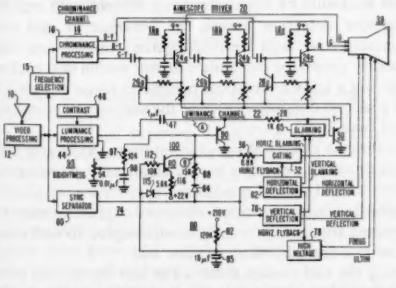
applying an alternating current maintain voltage signal to said cell of a constant magnitude insufficient to initiate a gas discharge or to maintain a sequence of gas discharges or relatively constant intensity for an indefinite length of time, the maintain voltage magnitude being sufficient to maintain a sequence of gas discharges for a number of cycles of the maintain voltage signal proportional to the selected dimension of said trigger signal.

4,067,048

AUTOMATIC BEAM CURRENT LIMITER

Marvin Neil Norman, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 19, 1976, Ser. No. 715,861
Int. Cl.[2] H04N *5/68*
U.S. Cl. 358—243 **7 Claims**



1. In a system for processing television signals including a luminance component, said system including a luminance channel for processing said luminance component, an image reproducing device, and high voltage supplying means for providing operating potential for said image reproducing device, apparatus responsive to excess current drawn by said image reproducing device comprising:

sensing means for deriving a control voltage representing the magnitude of current drawn by said image reproducing device from said high voltage supplying means;

a control amplifier transistor having an input coupled to said sensing means and having an output coupled to said luminance channel, said transistor exhibiting a threshold conduction level defining first and second conductive conditions; and

clamping means, exhibiting a clamping conduction level and operative independent of said transistor, coupled to said sensing means for clamping said control voltage to a reference potential to inhibit undesired excursions of said control voltage in one direction when said current is less than a predetermined level to thereby facilitate a desired response time of said apparatus, such that said control transistor exhibits said first conductive condition when the magnitude of current drawn by said image reproducing device is substantially equal to or less than said predetermined level;

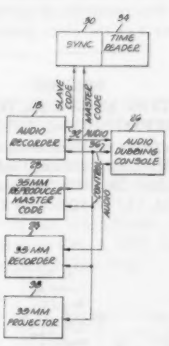
said clamping means being rendered non-conductive and said control transistor exhibiting said second conductive condition when said current exceeds said predetermined level to provide an output signal of a magnitude proportional to the amount by which said predetermined level is exceeded for translating said luminance component in a direction to proportionally reduce the magnitude of said current toward said predetermined level.

4,067,049

SOUND EDITING SYSTEM

Joseph D. Kelly, Glendale; Emory M. Cohen, Santa Monica; Barry K. Henley, Canoga Park; Hammond H. Holt, Sherman Oaks, and John Agalsoff, Downey, all of Calif., assignors to Glen Glenn Sound, Hollywood, Calif.

Filed Oct. 2, 1975, Ser. No. 619,030
Int. Cl.[2] G11B *15/18*
U.S. Cl. 360—14 **6 Claims**



1. A sound editing system comprising

a. a video recording means having means for starting and stopping said video recorder means;

b. a first multi-channelled audio tape recorder having means for starting and stopping said first audio tape recorder;

c. means for synchronizing the movement of said video recorder and said multi-channelled audio tape recorder;

d. means for visually displaying the position of at least one of said recorders at any time;

e. a second audio tape recorder, said second audio tape recorder having its audio output connected to a control board, said control board having means for activating a selected channel of said first multi-channelled audio tape

recorder, and the output of said control board connected to the input of said first multi-channelled audio recorder;

f. said control board having a plurality of means for acting upon the input signal to said control board to alter the characteristics of said input signal; and

g. means for providing a switching signal on at least one channel of said first multi-channelled audio tape recorder for switching the output signal on a second channel of said first multi-channelled audio tape recorder to a selected one of said plurality of means for acting on the input signal to said control board.

4,067,050

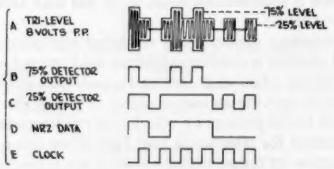
PROGRAMMED PRESENTATION SYSTEM

Clement W. Munninghoff, Cincinnati, Ohio, assignor to Cincinnati Electronics Corporation, Cincinnati, Ohio

Division of Ser. No. 412,963, Nov. 5, 1973, Pat. No. 3,987,484. This application Sept. 1, 1976, Ser. No. 719,468

Int. Cl.[2] G11B *5/09, 5/02*

U.S. Cl. 360—40 **20 Claims**



1. A system for detecting clock and binary data signals on a moving magnetic tape comprising a track on the tape having a relatively constant frequency audio carrier while the tape is moving at a substantially constant speed, said carrier having three predetermined envelope amplitude levels, two of said levels being associated with different binary values, and the third level being associated with clock pulses, playback means responsive to the audio carrier, said playback means including means for detecting the three amplitude levels of the carrier, and means responsive to the detected amplitude levels for deriving signals indicative of the magnitude of the binary data and of the occurrence of the clock pulses.

4,067,051

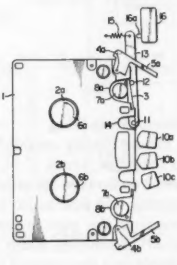
CARTRIDGE TYPE MAGNETIC RECORDING AND REPRODUCING SYSTEM

Yuji Nakamura, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed June 28, 1976, Ser. No. 700,497

Int. Cl.[2] G11B *15/66, 15/18*

U.S. Cl. 360—95 **2 Claims**



1. A magnetic recording and reproducing system of the type employing a tape cartridge having a magnetic tape wound therein on first and second reel hubs and including means for withdrawing a length of tape from the cartridge and pressing it against a magnetic transducer, wherein the improvement comprises:

first and second rotatable reel mounts having said reel hubs mounted thereon,

a take-up motor coupled to said first reel mount, said take-up motor rotating said first reel mount to wind the tape back into the cartridge when the pressure on said tape which holds it against said magnetic transducer is released and the tape becomes slack,

braking means for applying a braking force to said second reel mount when said system is not in the recording, reproducing or fast-forward modes,

a tape tension increase sensing member for sensing the increase in tape tension when said tape is wound back into said cartridge by said take-up motor, and

stopping means for stopping rotation of said first reel mount by said take-up motor when said sensing member senses the increase of tape tension, whereby said tape is accommodated within said cartridge without any slack therein.

4,067,052

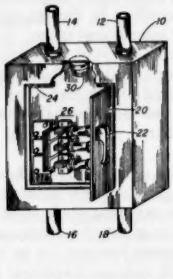
PROCESS FOR DETECTING ELECTRICAL FAULTS

Charles J. Neuhoff, R.D. 5 Delta Lane, Johnstown, Pa. 15905

Continuation-in-part of Ser. No. 490,020, July 19, 1974, abandoned. This application May 3, 1976, Ser. No. 682,349

Int. Cl.[2] H02H *3/16*

U.S. Cl. 361—42 **11 Claims**



1. A process for detecting at an incipient stage thereof, phase-to-phase and phase to ground faults characterized by arcing and generated in an enclosure configured and dimentioned to provide a volumetric capacity substantially only for retaining select electrical power distribution and regulation components within a normally enclosed and stable environment of atmospheric air, said enclosure being situate at a predetermined location within a power input system wherein electrical circuits extend in power supply relationship into said enclosure and are coupled electrically with said components, comprising the steps of:

monitoring the said atmospheric air environment only of said enclosure by the surveillance thereof with ionization chamber detection means, the presence of said arcing characterized fault derived ionized matter and subsequently generated particulate matter within said enclosure altering a known electrical parameter thereof from a first to a second condition to sense the said incipient stage of a said fault;

generating an electrical signal in response to the said ionization chamber detection means electrical parameter alteration to said second condition;

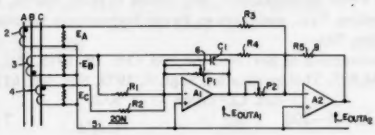
transmitting said generated electrical signal to means for opening the said electrical circuit coupled to said component at which said fault occurs; and

opening the said electrical circuit to halt the flow of current therewithin to said component at which said fault occurs in response to said signal transmitted to said means for opening said electrical circuit.

4,067,053
ACTIVE SYMMETRICAL COMPONENT SEQUENCE FILTER

Kung C. Chow, Whippany, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 3, 1976, Ser. No. 692,695
Int. Cl.[2] H02H 3/26
U.S. Cl. 361—76 **24 Claims**

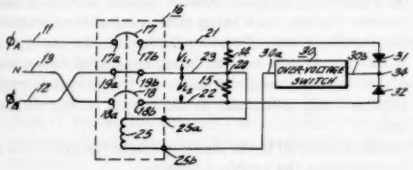


1. A symmetrical component deriving network for a three-phase electrical system having phase conductors *a, b* and *c* with a phase rotation *a,b,c,* said network comprising first and second circuit means energized by first and second electrical quantities respectively, said quantities being derived from the quantities Q of said phase conductors, said first circuit means having a first phasor voltage output quantity which is the phasor quantity $Qc-Qb$ where Qb and Qc are the quantities Q of the phase conductors *b* and *c* respectively, said second circuit means having a second phasor voltage output quantity which is the phasor quantity $Qa-Qb$ where *Qa and Qb* are the quantities Q of the phase conductor *a* and *b* respectively, a phase shifting device having its input energized with said first phasor quantity and having an output circuit, said phase shifting device being effective to shift the phase of said first phasor quantity to provide third phasor quantity at an angle of $+120°$ with respect to said first phasor quantity, a summing network having first and second input circuits and an output circuit, said first input circuit of said summing network being energized by the third phasor quantity, said second input circuit of said summing network being energized by said second phasor quantity, said summing network having an output quantity proportional to the negative symmetrical component of said electrical system having the phase rotation *a,b,c.*

4,067,054
OVER-VOLTAGE PROTECTION

William Randolph Clark, Bedford, MA, assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Apr. 29, 1976, Ser. No. 681,691
Int. Cl.[2] H02H 3/20
U.S. Cl. 361—91 **9 Claims**



1. Circuit protection apparatus for disconnecting a power distribution circuit having a plurality of energized lines and a neutral line coupled between an A.C. energy source and a utilization device, said apparatus comprising:

circuit interruption means having a pole in electrical series connection with each said energized line;

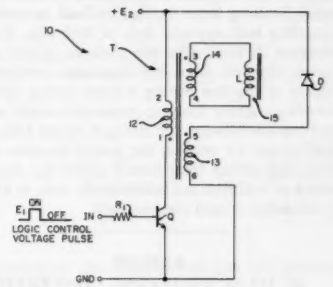
trip means coupled to said circuit interruption means for substantially simultaneously disconnecting all said energized lines from said utilization device responsive to an energization of said trip means; and

an over-voltage sensor of the Avalanche type coupled to each said energized line and adapted to couple a substantially zero amount of energy to said trip means when the voltages on all said energized lines are less than a predetermined value and to energize said trip means responsive to a voltage on at least one energized line in excess of said predetermined value, said over-voltage sensor and said trip means being connected to said power distribution circuit in such a manner that said sensor will energize said trip means even when said neutral line is open.

4,067,055
HIGH-SPEED INDUCTANCE DRIVER

Philip W. Koetsch, San Diego, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Oct. 26, 1976, Ser. No. 735,662
Int. Cl.[2] H01H 47/32
U.S. Cl. 361—159 **6 Claims**



1. A driver circuit comprising:

a transformer having primary, secondary and tertiary windings;

a driver switch for connecting a power source in circuit with the primary winding of said transformer;

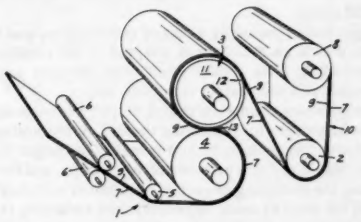
an inductive load connected in circuit with the secondary winding of said transformer; and

unidirectional current means connecting the tertiary winding in circuit to said power source for purposes of directing the energy stored in the inductive load back to the driving source.

4,067,056
POLING MACHINE FOR CONTINUOUS FILM OF PYROELECTRIC AND/OR PIEZOELECTRIC MATERIAL

Allen L. Taylor, Woodbury, and William F. Sheffield, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 479,663, June 17, 1974, abandoned. This application Oct. 1, 1976, Ser. No. 728,513
Int. Cl.[2] H01G 7/02
U.S. Cl. 361—233 **8 Claims**



1. A poling apparatus for continuously processing a length of film of polymeric material to semipermanently align the

dipoles of the film to provide at least one of pyroelectric and piezoelectric properties in the film, which apparatus comprises:

a drive means for continuously advancing said film past a poling station;

a first means for applying an electrical potential on at least one side of a portion of said film;

a second means located at the poling station and spaced from an opposite side of said film for coacting with said first means to establish an electric field greater than 4,000 volts/mm across said portion of said film for aligning the dipoles of said portion to provide at least one of pyroelectric and piezoelectric properties in said portion of said film, one of which of said first and second means provides heat for raising the temperature of at least a segment of said portion of said film above the film poling temperature during at least a portion of the time the alignment of the dipoles of said segment is influenced by said electric field;

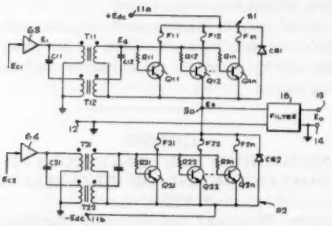
a current limiting layer carried on said second means for contacting said opposite side of said film, the electrical resistance between opposite surfaces of said layer being substantially less than the resistance between opposite surfaces of the film during normal poling operation, and providing current limiting protection when an electrical short occurs between the surfaces of the film; and

a fixing means for cooling the heated portion of said film below said poling temperature while the dipoles of said portion of said film are substantially held in alignment by the influence of said electric field.

4,067,057
DC TO AC SWITCHING CONVERTER

Fausto V. Taddeo, San Gabriel, and Raymond W. Pauly, Newport Beach, both of Calif., assignors to Pacific Electronic Enterprises Inc., Rosemead, Calif.

Filed June 25, 1976, Ser. No. 699,865
Int. Cl.[2] H02M 1/12
U.S. Cl. 363—41 **15 Claims**



1. A DC to AC power converter comprising:

a plurality of input terminals adapted to be connected to a source of DC power, one of said terminals being connectable to a reference voltage of said DC power source;

a plurality of switch means including at least first and second switches directly connected to at least some of said input terminals, each switch being switchable between On and Off states;

output means including a pair of converter output terminals to which an AC load is adapted to be connected, and including filter means connected between said switch means and said output terminals; and

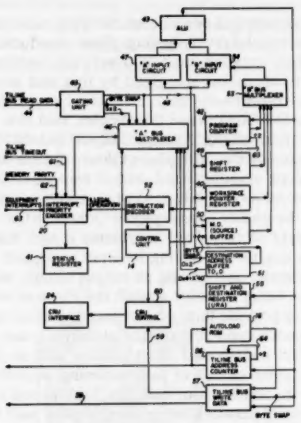
control means connected to said output terminals and to said switch means for regulating the AC output voltage at said output terminals to be at a preselected output frequency, definable as f_o of a preselected waveshape, and for controlling the switching of each of said power switches between its On and Off states, with a selected switching frequency, definable as f_s, where $f_s = nf_o$, n being not less than 10

said control means include means for applying turn-on and turn-off signals to each of said switches, to respectively drive the switch to its On and Off states, respectively, and means for controlling the application of a turn-on signal to one of said switches only after the passage of a preselected time interval following the application of a turn-off signal to the other of said switches.

4,067,058
WORKSPACE ADDRESSING SYSTEM

David Peter Brandstaetter, and James Marion Harris, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 408,150, Oct. 19, 1973, Pat. No. 3,944,985. This application Sept. 8, 1975, Ser. No. 611,478
Int. Cl.[2] G06F 9/18, 9/20
U.S. Cl. 364—200 **7 Claims**



1. A high speed context switching computer having a memory comprising:

a. a multi-bit multi-function arithmetic unit having two inputs and an output;

b. a workspace pointer register, a program counter register and a status register containing the address of the first element of a first workspace in memory of a problem program, the address of the current instruction in the problem program and the status of the problem program, respectively;

c. a first and second multiplexer each having its output connected to a respective one of the inputs of the arithmetic unit, the workspace pointer register and the program counter register each being connected at their outputs to the inputs of one of the multiplexers, the input to the workspace pointer register being connected to the output of the memory and the input to the program counter register being connected to the output of the arithmetic unit;

d. means connected to the memory and to the arithmetic unit for executing the problem program;

e. control means having an interrupt signal input, said control means being connected to the means for executing and he arithmetic unit, operable upon occurrence of an interrupt signal, for stopping the problem program and for performing an interrupt program, said control means including means for storing in elements of a second workspace located at addresses in memory a predetermined number of locations from the absolute address of the first element thereof, the contents of the registers at the instant of the occurrence of the interrupt signal; and

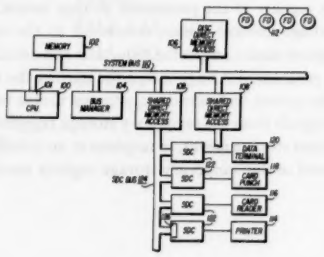
f. control means operable upon completion of the interrupt program to return to the registers the contents of the predetermined elements for resumption of execution of

the problem program at the point therein at which the interrupt signal occured.

4,067,059
SHARED DIRECT MEMORY ACCESS CONTROLLER

Nicholas Derchak, Hatfield, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 29, 1976, Ser. No. 653,408
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 **15 Claims**



1. In a data processing system having a common address bus and a common data bus interconnecting a central processor and a memory, and a plurality of peripheral devices, the improvement comprising:

an addressable direct memory access unit connected to said common address and data buses for controlling the direct transfer of data between said peripheral devices and said memory, a plurality of addressable subsystem device controllers connected between said direct memory access controller and the peripheral devices controlled by said direct memory access controller, a common subsystem device controllers to said direct memory access controller;

address recognition means in said shared direct memory access controller for recognizing some of the address bits on said common address bus as the address of said shared direct memory access controller;

gating means responsive to said address recognition means and an INPUT instruction from said central processor for gating address bits on said common address bus onto said common subsystem bus as the address of a status register in a selected on of said subsystem device controllers;

said selected subsystem device controller including a status register and means returning the value in its status register to said shared direct memory access controller over said common subsystem bus;

a register in said direct memory access controller for receiving and storing said value; and,

means transferring said value to said central processor from said register over said common data bus, whereby said INPUT instruction functions both to start a device controller and cause its status to be transferred to said central processor.

4,067,060
TRANSFER FUNCTION MEASUREMENT

Denis Poussart, and Udaya Ganguly, both of Ste-Foy, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed July 6, 1976, Ser. No. 702,764
Int. Cl.[2] G06F *15/34*
U.S. Cl. 364—553 **4 Claims**

1. Apparatus for the measurement in real-time of the transfer function in both magnitude and phase of an unknown system comprising:

a. means for engendering a pseudo-random binary sequence test signal, said signal spectrum being white in amplitude;

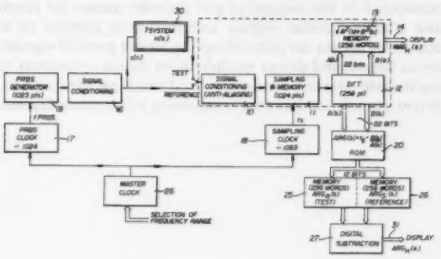
b. a sampling and memory circuit;

c. means to apply the test signal either directly to the sampling and memory circuit as a reference signal or to the unknown system such as to obtain a response signal that is applied to the sampling and memory circuit;

d. means to match the timing of the said test signal and the sampling and memory circuit;

e. means connected to the output of the sampling and memory circuit for measuring the discrete fourier transform in terms of magnitude and phase of the signal applied from the sampling and memory circuit;

f. means for computing the magnitude portion of the transfer function from the signal obtained from the means for measuring discrete fourier transform, storing said magnitude portion of the transfer function and passing to an output;



g. means for computing the phase portion of the transfer function from the signal obtained from the means for measuring discrete fourier transform;

h. a first memory means connected to the output of the means for computing the phase portion of the transfer function for storing the phase portion of the transfer function in relation to the reference signal;

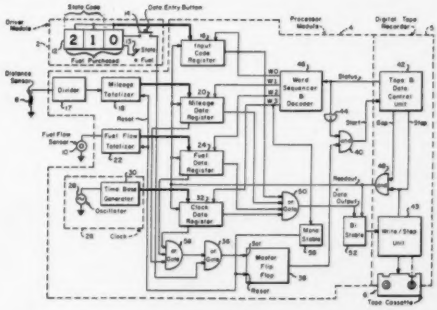
i. a second memory means connected to the output of the means for computing the phase portion of the transfer function for storing the phase portion of the transfer function in relation to the response signal; and

j. means for subtracting the signal obtained from the first and second memory means and passing the result to an output.

4,067,061
MONITORING AND RECORDING SYSTEM FOR VEHICLES

John Emil Juhasz, Lake Orion, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 18, 1975, Ser. No. 559,509
Int. Cl.[2] G06F *3/05, 3/02, 13/00*
U.S. Cl. 364—900 **8 Claims**



1. A vehicle mounted system for monitoring and storing values of parameters associated with operation of the vehicle

comprising sensor means connected to the vehicle for sensing values of operational parameters of the vehicle, pulse producing means connected to the sensor means for producing pulses representative of the values of operational parameters of the vehicle in response to the sensor means, counter means connected to the pulse producing means for receiving and accumulating pulses from the pulse producing means and providing parallel signals representative of the accumulated pulses, temporary storage register means connected to the counter means for receiving and storing the signals from the counter means and including paralled to series converter means for converting the stored signals from paralled to series signals, sequencer and decoder means connected to the temporary storage register means for reading out the stored series signals in a predetermined sequence upon initiation, input code register means connected to the sequencer and decoder means for receiving and storing parallel signals and including parallel to series converter means for converting the stored paraiiel signals to a series signals and driver module input means connected to the input code register means for producing parallel signals, the driver module input means comprising a first manually settable counter means for producing parallel signals representative of states and a second manually settable counter means for producing parallel signals representative of amounts of fuel received, data entry means connected to the driver module input means and connected to the sequencer and decoder means for selectively initiating operation of the sequencer and decoder means, and permanent storage means connected to the temporary storage register means for receiving the signals read out from the temporary storage register means, said sequencer and decoder means reading out the stored series signals from the input code register to the permanent storage means, and permanent storage control means connected to the temporary storage register means and to the sequencer and decoder means and to the permanent storage means for starting the sequencer and decoder means and permanent storage means for reading out series signals from the temporary storage register means to the permanent storage means, in response to an overflow of the signals stored in the temporary storage register means.

DESIGN PATENTS

GRANTED JANUARY 3, 1978

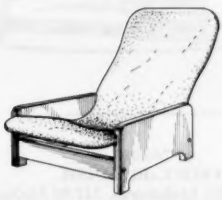
ERRATA

For CLASS	See PATENT NO.
D12–133	246,838
D15–032	246,845
D15–127	246,846
D19–087	246,847

DESIGNS

JANUARY 3, 1978

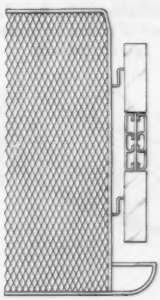
246,811
CHAIR
Gerhart P. Klein, and Brigitte I. Klein, both of 45 Raymond St., Manchester, Mass. 01944
Filed Aug. 4, 1976, Ser. No. 711,171
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—37



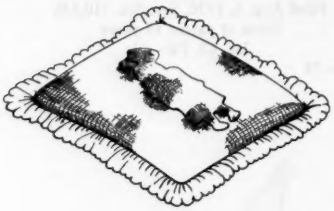
246,812
BOAT SEAT SHELL
Lawrence E. Canter, Bryan, and James E. Lammy, Napoleon, both of Ohio, assignors to Scott Port-A-Fold, Inc., Archbold, Ohio
Filed Sept. 12, 1973, Ser. No. 396,619
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—48

246,813
CHAIR
Thomas H. Tolleson, Green Bay, Wis., assignor to Krueger Metal Products, Inc., Green Bay, Wis.
Filed Aug. 2, 1976, Ser. No. 710,536
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—75

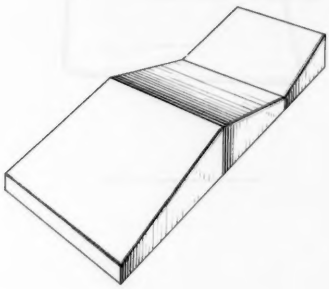
246,814
COMBINED DIVIDER AND SIGN HOLDER FOR MERCHANDISE BINS
Albert L. Peggs, 3450 Conata St., Duarte, Calif. 91010
Filed Mar. 24, 1976, Ser. No. 669,853
Term of patent 14 years
Int. Cl. D6—*99*; D20—*02*
U.S. Cl. D6—85



246,815
PILLOW
Phyllis S. Sillers, 14255 SW. Bonnie Brae St., Beaverton, Oreg. 97005
Filed Aug. 1, 1975, Ser. No. 601,022
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—202

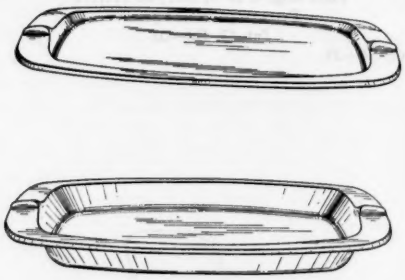


246,816
CONTOUR MAT
John Tam, 333 E. 53rd St., New York, N.Y. 10022, and Leonard Horowitz, 51 W. 81st St., New York, N.Y. 10028
Filed Mar. 12, 1974, Ser. No. 450,473
Term of patent 14 years
Int. Cl. D6—*09, 01*
U.S. Cl. D6—201

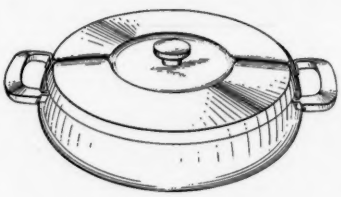


246,817
SKIRT HANGER
Mario Mainetti, Valdagno, (Vicenza), Italy, assignor to Mainetti S.p.A., Castelgomberto (Vicenza), Italy
Filed May 22, 1975, Ser. No. 579,826
Claims priority, application Italy, Dec. 5, 1974, 64296/74
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—252

246,818
FOOD DISH
Carl-Arne Breger, Lilla Molleberga, 212 90 Malmo, Sweden
Division of Ser. No. 453,153, March 20, 1974, Pat. No. Des. 239,687. This application Mar. 29, 1976, Ser. No. 671,485
Claims priority, application Sweden, Sept. 21, 1973, 731724
Term of patent 7 years
Int. Cl. D7—*01*
U.S. Cl. D7—1

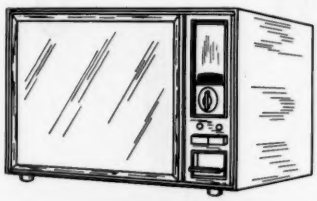


246,819
VEGETABLE DISH
Carl-Arne Breger, Lilla Molleberga, 212 90 Malmo, Sweden
Division of Ser. No. 453,153, March 20, 1974, Pat. No. Des. 239,687. This application Mar. 29, 1976, Ser. No. 671,484
Claims priority, application Sweden, Sept. 21, 1973, 731724
Term of patent 7 years
Int. Cl. D7—*01*
U.S. Cl. D7—17

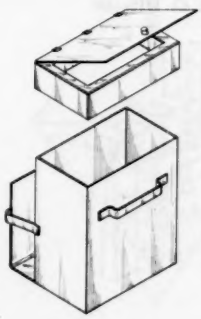


246,820
ELECTRONIC COOKING RANGE
Yoshio Suganoya, and Takao Miyake, both of Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Aug. 16, 1976, Ser. No. 714,582
Claims priority, application Japan, Feb. 20, 1976, 51-5661
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—128

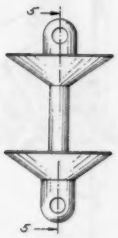
246,821
COOKING RANGE
Yoshio Suganoya, and Takao Miyake, both of Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Aug. 16, 1976, Ser. No. 714,583
Claims priority, application Japan, Feb. 20, 1976, 51-5660
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—128



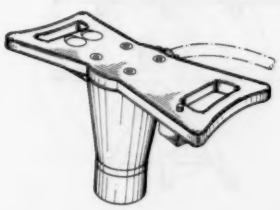
246,822
COMBINED TRASH CONTAINER AND TRASH BAG HOLDER
William Stoufer, 521 Alvarado Way, Davis, Calif. 95616
Filed Jan. 29, 1976, Ser. No. 653,365
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—194



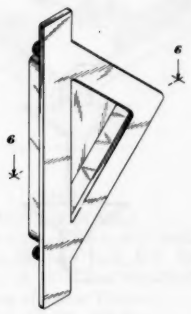
246,823
PLASTIC LINE MISSILE TO BE USED WITH FISHING LINE IN ELECTRICAL CONDUIT OR PIPE
Warren E. Duclon, Rockford, Ill., assignor to Greenlee Bros. & Co., Rockford, Ill.
Filed July 21, 1976, Ser. No. 707,414
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14



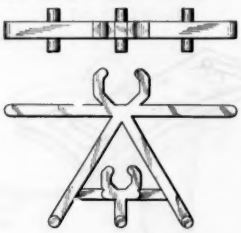
246,824
PORTABLE DENT REMOVER
Karl A. Hansen, and I. Glen Hendrickson, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Sept. 27, 1976, Ser. No. 726,871
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—67



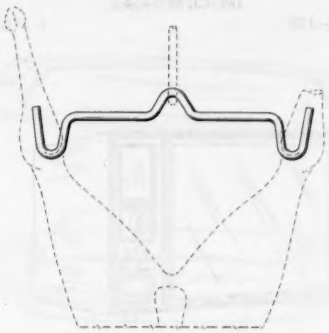
246,825
DRAWER PULL
Mortimer Deutsch, 50-39 175th Place, Fresh Meadows, N.Y. 11365
Filed Dec. 13, 1976, Ser. No. 749,668
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—319



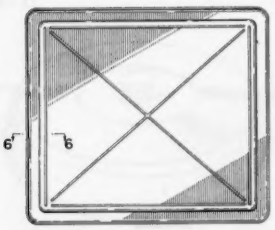
246,826
REINFORCING ROD SUPPORT
Robert J. Ilukowicz, 60 Howe Road, Coram, N.Y. 11727
Filed Feb. 6, 1976, Ser. No. 655,751
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—354



246,827
HOOK FOR SUSPENDING AN ANIMAL
Robert N. Crawford, 410 Lakeview, Sugarland, Tex. 77478
Filed Mar. 31, 1976, Ser. No. 672,529
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—370



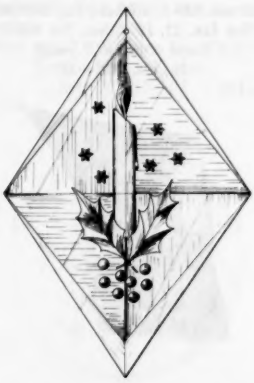
246,828
TOTE BOX LID
Thomas H. White, Issaquah, Wash., assignor to Rubbermaid Industrial Products Corporation, Statesville, N.C.
Filed June 4, 1976, Ser. No. 693,223
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—267



246,829
RAIN GAUGE BOX
Wilbur C. McEvers, 655 Ave. C. SW., Winter Haven, Fla.
Filed Dec. 9, 1975, Ser. No. 639,187
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—101

246,830
BRACELET
Elio Lossini, Johnston, R.I., assignor to Raybeth Tool & Die Co., Inc., Providence, R.I.
Filed June 1, 1976, Ser. No. 692,029
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—12

246,831
CHRISTMAS ORNAMENT
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Mar. 1, 1976, Ser. No. 662,752
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—125

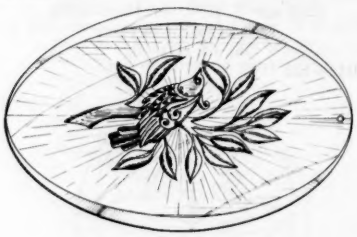


246,832
CHRISTMAS ORNAMENT
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Mar. 1, 1976, Ser. No. 662,753
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—125

246,833
CHRISTMAS ORNAMENT
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 7, 1976, Ser. No. 674,530
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—125

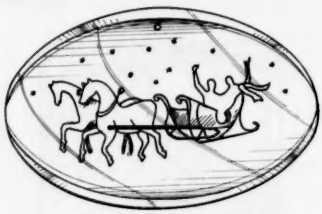
246,834
CHRISTMAS ORNAMENT
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Mar. 1, 1976, Ser. No. 662,754
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—127

246,835
CHRISTMAS ORNAMENT
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Mar. 1, 1976, Ser. No. 662,755
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—127

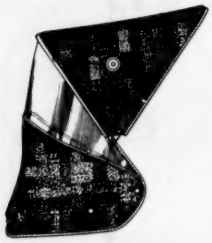


246,836
CHRISTMAS ORNAMENT
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Mar. 1, 1976, Ser. No. 662,756
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—128

246,837
CHRISTMAS ORNAMENT
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 7, 1976, Ser. No. 674,524
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—128



246,838
COMBINED STROLLER CANOPY AND REAR DRAPE THEREFOR
Robert J. Boudreau, 626 S. Richard St., Bedford, Pa. 15522
Filed Jan. 21, 1976, Ser. No. 650,911
Term of patent 7 years
Int. Cl. D12—*12*
U.S. Cl. D12—133



246,839
PLAQUE
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 7, 1976, Ser. No. 674,528
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—133

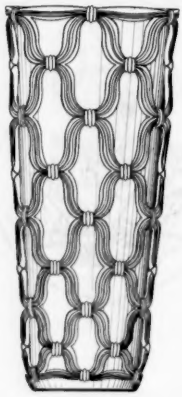
246,840
PLAQUE
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 7, 1976, Ser. No. 674,529
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—134

246,841
PLAQUE
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 7, 1976, Ser. No. 674,527
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—136

246,842
PLAQUE
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 7, 1976, Ser. No. 674,523
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—137

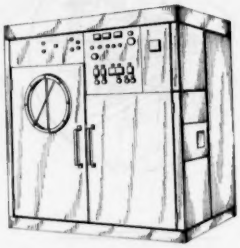
246,843
PLAQUE
Carl G. Bestler, Owatonna, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed May 24, 1976, Ser. No. 689,218
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—137

246,844
VASE
Ernest O. Brody, Cleveland, Ohio, assignor to Lancaster Colony Corporation, Columbus, Ohio
Filed Apr. 13, 1977, Ser. No. 787,067
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—152

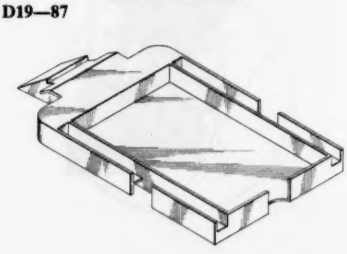


246,845
BALE HANDLING APPARATUS
Donald L. Sheesley, New Holland, and Allison W. Blanshine, Lititz, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.
Filed Jan. 15, 1976, Ser. No. 649,379
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—32

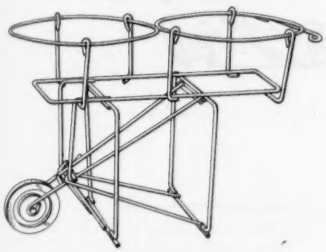
246,846
PLANING-MACHINE
Tosten Dahlin; John Grieves, both of Svartviksvagen 18, S-161 32 Bromma, and Torgny Lundin, Korpasv. 6A, S-433 00 Partille, all of Sweden
Continuation-in-part of Ser. No. 467,501, May 6, 1974, abandoned. This application May 28, 1976, Ser. No. 690,927
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—127



246,847
TELEPHONE ACCESSORY HOLDER
Paul H. Landau, and Harolyn S. Landau, both of 8632 W. Olympic Blvd., Los Angeles, Calif. 90035
Filed May 7, 1976, Ser. No. 684,164
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—87

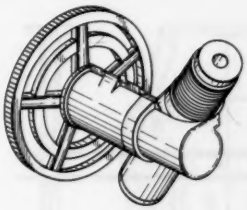


246,848
MOBILE GARBAGE CAN HOLDER
Johnny G. Allen, 603 Cedar Ave., Albany, Ga. 31701
Filed Dec. 9, 1976, Ser. No. 749,148
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—21

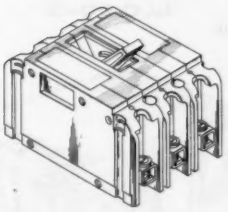


246,849
AUTOMOBILE
Frederick Leslie Hart, Cressage, England, assignor to GKN Sankey Limited, Bilston, England
Filed Mar. 4, 1977, Ser. No. 774,507
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—90

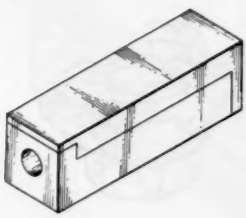
246,850
RIM DRIVE FOR A BICYCLE SPEEDOMETER
Charles F. Hennecke, Chicago, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.
Filed Dec. 18, 1975, Ser. No. 642,176
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—114



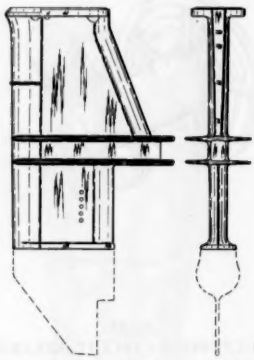
246,851
MULTI-POLE CIRCUIT BREAKER
Edward Tarchalski, Lawrenceville, N.J., and Albert D. Lisnay, Sarasota, Fla., assignors to Heinemann Electric Company, N.J.
Filed July 19, 1976, Ser. No. 706,277
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—34



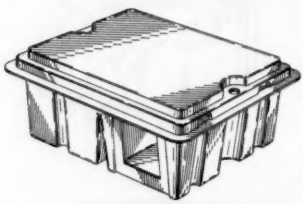
246,852
TELEPHONE JACK HOUSING AND COVER
James C. Deitch, Bloomington, Minn., assignor to Magnetic Controls Company, Minneapolis, Minn.
Filed May 27, 1976, Ser. No. 690,371
Term of patent 14 years
Int. Cl. D14—*99*; D13—*99*
U.S. Cl. D14—59



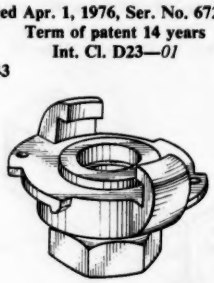
246,853
EXHAUST OUTLET HOUSING FOR OUTBOARD MOTORS
Donald J. Berchem, West Bend, Wis., assignor to Chrysler Corporation
Filed June 23, 1976, Ser. No. 699,106
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D15—4



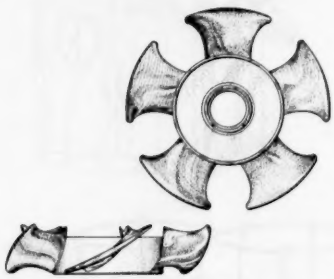
246,854
RODENT BAIT FEEDING BOX OR SIMILAR ARTICLE
Stanley Z. Baker, Cleveland Heights, Ohio, assignor to J. T. Eaton & Company, Cleveland, Ohio
Filed July 15, 1976, Ser. No. 705,689
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—18



246,855
COUPLING
Howard Archibald Treloar, 52 Maitland St., Mitcham, Australia (5062)
Filed Apr. 1, 1976, Ser. No. 672,834
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—43

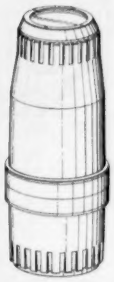


246,856
AIR IMPELLER
John F. O'Connor, Torrington, Conn., assignor to Torin Corporation, Torrington, Conn.
Filed Feb. 9, 1976, Ser. No. 656,394
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—165



246,857
APPARATUS FOR DETERMINING THE MELTING POINT OF MATERIALS
Martin Meuli, Oetwil, and Josef Tresch, Greifensee, both of Switzerland, assignors to Mettler Instruments AG, Zurich, Switzerland
Filed June 16, 1976, Ser. No. 696,730
Term of patent 14 years
Int. Cl. D24—*01*; D10—*05*
U.S. Cl. D24—8

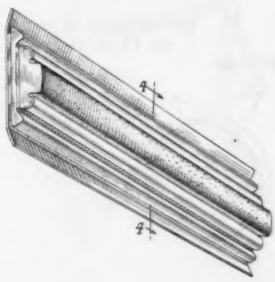
246,858
INSULATED HOLDER FOR A NURSING BOTTLE
Scott E. Larson, 313 Riverwoods Lane, Burnsville, Minn. 55337
Filed June 16, 1976, Ser. No. 696,682
Term of patent 14 years
Int. Cl. D24—*99*; D7—*01*
U.S. Cl. D24—48



246,859
SCAFFOLD JACK
Earl E. Schmitz, 123 - 5th Ave. SE., Beach, N. Dak. 58621
Filed June 9, 1976, Ser. No. 694,164
Term of patent 7 years
Int. Cl. D25—*99*
U.S. Cl. D25—68

246,860
PLANT TRELLIS
Raymond L. Facey, 146-61 Lakewood Ave., Jamaica, N.Y. 11435
Filed Aug. 6, 1976, Ser. No. 712,249
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—71

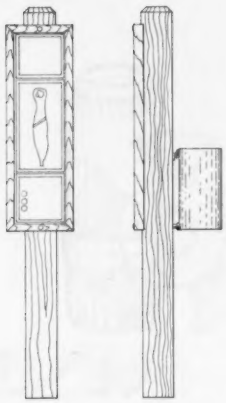
246,861
COMBINED TRIM STRIP AND REMOVABLE PAPER BACKING THEREFOR
Brian A. Wenrick, Dayton, Ohio, assignor to Helene Curtis Industries, Inc., Chicago, Ill.
Filed Jan. 26, 1976, Ser. No. 652,207
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—79



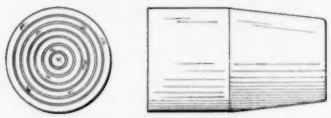
246,862
LIGHTER FOR SMOKERS
Lars-Erik Hallden, Geneva, Switzerland, assignor to Interfeudor S.A., Geneva, Switzerland
Filed July 15, 1976, Ser. No. 705,605
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—39

246,863
LIGHTER
Franz Alban Stützer, Mulheim (Main), Germany, assignor to Rowenta-Werke, GmbH, Offenbach (Main), Germany
Filed Nov. 24, 1976, Ser. No. 744,621
Claims priority, application Germany, June 4, 1976, 5 MR 9951
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

246,864
COMBINED FAIRWAY MAP REFUSE RECEIVER AND YARD MARKER FOR A GOLF COURSE
Peter J. Genova, P.O. Box 309, Oakdale, Calif. 95361
Filed June 28, 1976, Ser. No. 695,181
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB



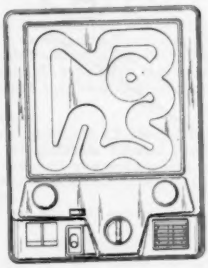
246,865
GOLF PUTTER HEAD
John F. Krysakowski, 186 Berrian Road, Stamford, Conn. 06905
Filed Mar. 1, 1976, Ser. No. 662,889
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



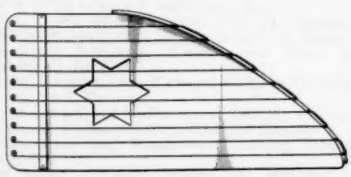
246,866
TOY AIRPLANE
James F. Loomis, Seattle, Wash., assignor to Industrial & Promotional Toys, Inc., Seattle, Wash.
Filed Nov. 28, 1975, Ser. No. 635,972
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH

246,867
TOY AIRPLANE
James F. Loomis, Seattle, Wash., assignor to Industrial & Promotional Toys, Inc., Seattle, Wash.
Filed Nov. 28, 1975, Ser. No. 635,974
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH

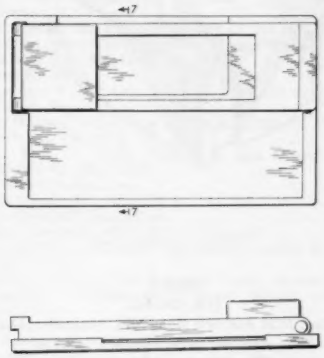
246,868
RACING GAME BOX
Hitoshi Itakura, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Sept. 30, 1976, Ser. No. 728,384
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CC



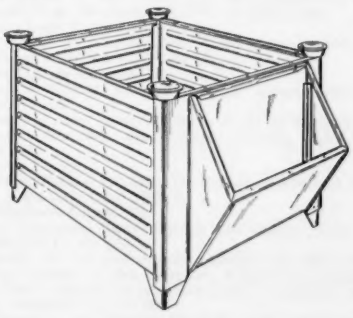
246,869
BOX HARP
Adele K. Ledford, 3211 Castlewood, Houston, Tex. 77025
Filed Dec. 18, 1975, Ser. No. 641,735
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A



246,870
CREDIT CARD IMPRINTER OR SIMILAR ARTICLE
Paul A. Kalb, 268 Ocean Ave., Islip, N.Y. 11751, and Roy H. Lindberg, 164 S. Windsor Ave., Brightwaters, N.Y. 11718
Filed Mar. 22, 1976, Ser. No. 669,151
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—11 B



246,871
MATERIAL HANDLING BOX
Robert L. Silver, and Bert R. Eisenhut, both of Racine, Wis., assignors to Triple E Corporation, Racine, Wis.
Filed Mar. 10, 1976, Ser. No. 665,508
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1 R

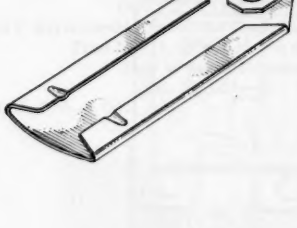


246,872
TOTE BOX
Thomas H. White, Issaquah, Wash., assignor to Rubbermaid Industrial Products Corporation, Statesville, N.C.
Filed June 4, 1976, Ser. No. 693,224
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D87—1 R

246,873
HANDBAG
Laura J. Kling, 2030 Amherst Road NE., Massillon, Ohio 44646
Filed Apr. 30, 1976, Ser. No. 682,106
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 C

246,874
HANDBAG
Lawrence B. Schwartz, Fairfield, Conn., assignor to Acricite Company, Inc., Bridgeport, Conn.
Filed Nov. 3, 1976, Ser. No. 738,583
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F

246,875
COMBINED KEY AND COIN HOLDER
Wallace D. Ellison, 3116 Glendon Ave., Los Angeles, Calif. 90034
Filed Oct. 1, 1975, Ser. No. 618,377
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—8.4



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF JANUARY, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See—*
Mastalski, Henry N.; Lucas, James P.; Dziedzic, Edward; and Eppinger, David P., 4,066,368, Cl. 403-211.000.

A. B. Dick Company: *See—*
Arway, George, 4,067,020, Cl. 346-75.000.

A-T-O Inc.: *See—*
Carter, Sidney T., 4,066,808, Cl. 427-428.000.

Aardal, Martin John, to Schlegel (UK) Limited. Mounting of rollers for patio doors. 4,065,827, Cl. 16-106.000.

Aatinen, Eino, to Valmet Oy. Rolls and roll-manufacturing methods. 4,065,842, Cl. 29-148.40D.

AB Bofors: *See—*
Hultgren, Karl Sten Rudolf; and Svensson, Sven-Hakan, 4,065,999, Cl. 89-36.00H.

AB Kabi: *See—*
Jonsson, Nils Ake; Merenyi, Ferenc; and Westlund, Lars-Erik, 4,066,408, Cl. 23-230.00R.

AB Tellusond: *See—*
Hill, Jan, 4,066,492, Cl. 162-49.000.

Abbott Laboratories: *See—*
Lee, Cheuk Man; Michaels, Raymond John; and Harris, Louis Selig, 4,066,667, Cl. 260-345.300.

Abel, Heinz; and Topfl, Rosemarie, to I.W.S. Nominee Company Limited; and Ciba-Geigy AG. Process for modifying keratinous materials. 4,066,392, Cl. 8-127.500.

Abu-Isa, Ismat A.: *See—*
Eldred, Roger J.; Iobst, Stanley A.; and Abu-Isa, Ismat A., 4,066,590, Cl. 260-28.50A.

ACF Industries, Incorporated: *See—*
Atkinson, Eulas R.; and Kemp, Willard E., 4,066,240, Cl. 251-175.000.

Achter, Eugene K., to Baxter Travenol Laboratories, Inc. Method and apparatus for deriving oxygen association curves. 4,066,361, Cl. 356-41.000.

Ackerman, Thomas Liddon; Barbato, Mathew Martin; and Vidmantas, Eugene, to Sybron Corporation. Electromagnetic flowmeter having removable electrode leads. 4,065,965, Cl. 73-194.0EM.

Ackrell, Jack, to Syntex (U.S.A.) Inc. 6,11-Dihydrodibenzo-[b. e.]-thiepin-11-one-3-aldehyde and 3-acetal derivatives. 4,066,663, Cl. 260-327.00B.

Adamation, Inc.: *See—*
Perry, Kenneth E., 4,066,472, Cl. 134-34.000.

Adams, Jim Mills; and deZabala, Edward Francis, to Hoffmann-La Roche Inc. Apparatus for high-speed accurate counting and handling of discrete objects such as tablets. 4,066,173, Cl. 214-1.00C.

Adams, John M.: *See—*
Alferness, Clifton A.; and Adams, John M., 4,066,086, Cl. 128-421.000.

Adderley, Edward, to Sociedad Espanola Del Acumulador Tudor S.A. Method of sealing an intercell connection in a multi-cell electric storage battery. 4,066,418, Cl. 29-623.500.

Addressograph-Multigraph Corporation: *See—*
Bradbury, Wilburn F., 4,066,255, Cl. 271-265.000.
Garcowski, Ronald J.; and Davis, William A., 4,066,017, Cl. 101-425.000.

Adee, Raymond A., to Hesston Corporation. Tandem folding implement. 4,066,274, Cl. 280-411.00A.

Adelstein, Gilbert W.; Dajani, Esam Z.; and Yen, Chung Hwai, to G. D. Searle & Co. 1-Triarylalkyl-4-phenyl-4-piperidine carboxylic acids and derivatives. 4,066,654, Cl. 260-293.690.

Aeritalia S.p.A.: *See—*
Johnson, Joseph M., 4,066,214, Cl. 239-265.190.

Agalsoff, John: *See—*
Kelly, Joseph D.; Cohen, Emory M.; Henley, Barry K.; Holt, Hammond H.; and Agalsoff, John, 4,067,049, Cl. 360-14.000.

Agence Nationale de Valorisation de la Recherche Anvar: *See—*
Bertaux, Jean-Loup; and Quessette, Jacques Alain, 4,066,904, Cl. 250-372.000.

Agency of Industrial Science & Technology: *See—*
Nakatani, Kiyoshi; Imamura, Juichi; Ichikawa, Toshiyuki; Takeuchi, Kouichi; and Kotaka, Kenji, 4,066,707, Cl. 260-613.00R.
Wada, Shinji; Matsunaga, Yoshiaki; and Noda, Michihiro, 4,066,540, Cl. 210-44.000.

Agey, Michael J. Instant coffee dispenser. 4,066,186, Cl. 222-48.000.

AGFA-Gevaert, AG: *See—*
Helmberger, Josef; and Stadler, Klaus, 4,066,355, Cl. 355-38.000.
Kwiatkowski, Wolfgang. 4,067,034, Cl. 354-310.000.
Lermann, Peter; and Wagensonner, Eduard, 4,067,028, Cl. 354-141.000.
Paulus, Rudolf; Gutmann, Walter; and Hofmann, Wilfried, 4,066,328, Cl. 350-7.000.
Plursch, Gerald; and Leuchter, Jurgen, 4,067,035, Cl. 354-313.000.
Vesper, Rainer; and Engelsmann, Dieter, 4,067,029, Cl. 354-137.000.
Wagensonner, Eduard, 4,066,347, Cl. 352-141.000.
Wick, Richard, 4,066,252, Cl. 271-3.000.

AGFA-Gevaert, N.V.: *See—*
Van Cappellen, Jan Baptist, 4,066,729, Cl. 264-169.000.

Ahle, James L., to Gulf Oil Corporation. Method of selectively combating wild oats. 4,066,439, Cl. 71-111.000.

Ahn, Byung K.: *See—*
Kadija, Igor V.; and Ahn, Byung K., 4,066,519, Cl. 204-98.000.

Ahrens, Ulrich: *See—*
Oeser, Henning; and Ahrens, Ulrich, 4,066,549, Cl. 210-177.000.

Air Products and Chemicals, Inc.: *See—*
Dixon, Dale D.; Ford, Michael E.; and Mantell, Gerald J., 4,066,630, Cl. 260-77.50D.

Air Tech Industries Inc.: *See—*
Fraioli, Donato M., 4,065,889, Cl. 52-2.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Ishigami, Noriakira, 4,066,303, Cl. 303-6.00C.
Ohmi, Atsushi; and Katagiri, Masayoshi, 4,066,997, Cl. 340-59.000.

Aizawa, Hiroshi: *See—*
Yoshikawa, Ryoichi; Oda, Teruhisa; Tanaka, Kunio; Iura, Yukio; Fukushima, Tadahide; and Aizawa, Hiroshi, 4,067,032, Cl. 354-288.000.

Ajinomoto Co., Inc.: *See—*
Asai, Soichiro; Matsuishi, Tsutomu; Matsushita, Katsunobu; Ikeda, Shigeho; Kobayashi, Kaetsu; and Maruyama, Hiromasa, 4,066,502, Cl. 195-47.000.
Eguchi, Hajime, 4,066,793, Cl. 426-60.000.
Tosaka, Osamu; Morioka, Hajimu; Hirakawa, Hayao; Ishii, Kenji; Kubota, Koji; and Hirose, Yoshio, 4,066,501, Cl. 195-29.000.

Akamatsu, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor switch device having means for supplying control current to a control electrode. 4,066,956, Cl. 363-131.000.

Akers, Larry D.: *See—*
Scholl, Charles H.; and Akers, Larry D., 4,066,188, Cl. 222-146.0HE.

Aktiebolaget Karlstads Mekaniska Werkstad: *See—*
Haglund, Kjell, 4,066,034, Cl. 115-34.00R.
Haglund, Kjell; and Carlsson, Hakan Hasse, 4,066,035, Cl. 115-34.00R.

Akzona Incorporated: *See—*
Allen, Thomas C.; and Denning, David B., 4,066,584, Cl. 260-17.4CL.
Price, Richard T.; and Prodell, Rita C., 4,066,744, Cl. 424-12.000.

Alban, John M. Training aid for archery. 4,066,051, Cl. 124-86.000.

Albus, James S.: *See—*
Mogavero, Louis N.; Johnson, Edwin G.; Evans, John M., Jr; and Albus, James S., 4,067,015, Cl. 343-225.000.

Alcalay, Joseph, to J. I. Case Company. Oscillatory electro-hydraulic system. 4,066,004, Cl. 91-183.000.

Alcan Research and Development Limited: *See—*
Sheasby, Peter Geoffrey; and Cheetham, Graham, 4,066,816, Cl. 428-336.000.

Alde, Murray William, Sr. Hydraulic engine. 4,066,003, Cl. 91-170.00R.

Aldridge, Clyde L.; and Bearden, Roby, Jr., to Exxon Research & Engineering Co. Hydroconversion of heavy hydrocarbons. 4,066,530, Cl. 208-112.000.

Alferness, Clifton A.; and Adams, John M., to Medtronic, Inc. Programmable body stimulator. 4,066,086, Cl. 128-421.000.

Allan, John Leslie Hugh: *See—*
Kiss, Kornel Dezso; Allan, John Leslie Hugh; and Fein, Marvin Michael, 4,066,610, Cl. 260-42.210.

Allegheny Ludlum Industries, Inc.: *See—*
Zaremski, Donald R.; and Krepler, Albert, 4,066,521, Cl. 204-141.500.

Allen, David O.; and Wombold, Harry A. E., to Buckeye Molding Company. Container and closure assembly. 4,066,182, Cl. 215-256.000.

Allen, David O.: *See—*
Robinson, William H.; Allen, David O.; and Wombold, Harry A. E., 4,066,181, Cl. 215-256.000.

Allen & Hanburys Limited: *See—*
Lunts, Lawrence Henry Charles; and Collin, David Trevor, 4,066,755, Cl. 424-230.000.

Allen, Johnnie D. Shot shell reloading. 4,065,997, Cl. 86-39.000.

Allen, Jont Brandon, to Bell Telephone Laboratories, Incorporated. Method and apparatus for cancelling room reverberation and noise pickup. 4,066,842, Cl. 179-1.00P.

Allen, Thomas C.; and Denning, David B., to Akzona Incorporated. Alloy fibers of rayon and copolymers of acrylic and methacrylic acids. 4,066,584, Cl. 260-17.4CL.

Allevato, Louis. Garage door spring stretching device. 4,066,242, Cl. 254-10.500.

Allgaier, Werner, to Raychem GmbH. Strip supply lead with branch leads and method of making same. 4,066,840, Cl. 174-72.00R.

Allied Chemical Corporation: *See—*
Smith, Robert E.; Chytil, Frank S.; Feldstein, George; and Swartz, Dorman J., 4,066,217, Cl. 242-25.00R.
Stephenson, Robert L., 4,065,836, Cl. 24-230.00A.

Alpaugh, Warren Alan; Macur, George Joseph; and Vlasak, Gary Paul, to International Business Machines Corporation. Method for preparing substrate surfaces for electroless deposition. 4,066,809, Cl. 427-444.000.

Alps Electric Co., Ltd.: *See—*
Miura, Katsuhiko, 4,066,837, Cl. 174-35.0GC.

Alter, H. Ward: *See—*
Holub, Fred F.; and Alter, H. Ward, 4,065,972, Cl. 73-421.50R.

Althaus, Raymond L., to Motorola, Inc. Digital transponder universal pulse assembly. 4,067,011, Cl. 343-6.8LC.

Alton Box Board Company: *See—*
Griffith, Harold J., 4,066,205, Cl. 229-17.00B.

Alza Corporation: *See—*
Capozza, Richard C., 4,066,747, Cl. 424-78.000.

Ambrosiano, Nicholas A.: *See—*
Crounse, Nathan N.; and Ambrosiano, Nicholas A., 4,066,653, Cl. 260-293.610.

Amerace Corporation: *See—*
Brown, Robert R.; and Bressler, David E., 4,066,322, Cl. 339-111.000.

American Bank Note Company: *See—*
LaCapria, Anthony, 4,066,280, Cl. 283-8.00R.
van Haaften, Peter, 4,066,014, Cl. 101-157.000.

American Color & Chemical Corporation: *See—*
Botros, Raouf, 4,066,388, Cl. 8-41.00D.

American Cyanamid Company: *See—*
Henderson, William Arthur, Jr.; and Ramirez, Fausto, 4,066,783, Cl. 424-289.000.
Lutz, Albert William; and Diehl, Robert Eugene, 4,066,441, Cl. 71-121.000.
Nair, Vijay Gopalan; Joseph, Joseph Peter; and Bernstein, Seymour, 4,066,829, Cl. 536-103.000.
Oppelt, John Christian; and Susi, Peter Vincent, 4,066,614, Cl. 260-45.8NZ.
Safir, Sidney Robert; and Hofmann, Corris Mabelle, 4,066,647, Cl. 260-268.0TR.
Weyker, Robert George; and Baitinger, William Frederick, Jr., 4,066,391, Cl. 8-116.00P.

American Express Company: *See—*
Meyer, Russell L., 4,065,862, Cl. 364-200.000.

American Hoechst Corporation: *See—*
Effland, Richard C., 4,066,659, Cl. 260-326.13F.

American Home Products Corporation: *See—*
McGregor, William H.; and Dougherty, Joseph J., 4,066,634, Cl. 260-112.50S.

American Optical Corporation: *See—*
Shoemaker, Arthur H., 4,066,339, Cl. 350-175.00E.

American Photo-Graphics Corporation: *See—*
Edhlund, Ronald D., 4,065,990, Cl. 83-133.000.

American Sterilizer Company: *See—*
Gunther, Donald A., 4,066,399, Cl. 21-58.000.

AMF Incorporated: *See—*
Ross, Haldon, 4,066,154, Cl. 188-196.0BA.

Amicon Corporation: *See—*
Bolger, Justin C., 4,066,625, Cl. 260-59.00R.

AMP Incorporated: *See—*
Soes, Lucas, 4,066,327, Cl. 339-252.00R.
Villazon, Francisco, 4,066,321, Cl. 339-98.000.

Amtron, Division of the Sippican Corporation: *See—*
Fagan, John C., 4,065,911, Cl. 53-53.000.

Anazawa, Shinzo: *See—*
Tsuzuki, Naobumi; Anazawa, Shinzo; and Noguchi, Shozo, 4,067,040, Cl. 357-74.000.

Anderkay, Glenn Allan, to Deere & Company. Vibration isolation system. 4,066,058, Cl. 123-198.00E.

Anderson, James R., to Central Sprinkler Corporation. Sprinkler head assembly. 4,066,129, Cl. 169-37.000.

Anderson, John C.: *See—*
Rosenau, John R.; and Anderson, John C., 4,066,800, Cl. 426-582.000.

Anderson, Kenneth L.; and Kuper, Donald G., to Phillips Petroleum Company. Continuous reaction for preparation of arylene sulfide polymer. 4,066,632, Cl. 260-79.100.

Anderson, Petrus A.: *See—*
Lewandowski, Edward F.; and Anderson, Petrus A., 4,065,853, Cl. 30-361.000.

Anderson, Wallace E.; Syeles, Albert M.; and Krall, Albert D., to United States of America, Navy. Method of bonding gold films to non-electrically conducting oxides and product thereby obtained. 4,066,819, Cl. 428-472.000.

Andrews, Timothy Douglas, to Imperial Chemical Industries Limited. Metal deposition process. 4,066,804, Cl. 427-98.000.

Angelica Corporation: *See—*
Hornkohl, Owen T., 4,066,028, Cl. 112-121.290.

Anglin, Thurman L.: *See—*
Manning, Michael L.; Anglin, Thurman L.; and Grayson, Richard F., 4,066,913, Cl. 307-38.000.

Anheuser-Busch, Incorporated: *See—*
Voigt, John E.; and Pender, Herbert, Jr., 4,066,495, Cl. 162-168.0NA.

Anley, Frank C. Attitude control device. 4,066,266, Cl. 274-23.00R.

Antisavage, Joseph P.: *See—*
Christie, Nick J.; Antisavage, Joseph P.; and Brupbacher, Eugene E., 4,066,390, Cl. 8-110.000.

Antoine, Robert: *See—*
Diamand, Felix; Bourrabier, Guy; and Antoine, Robert, 4,066,979, Cl. 331-56.000.

Aoki, Keiji: *See—*
Segawa, Yoshihiro; Sato, Susumu; Yasuda, Eturo; Hattori, Tadashi; and Aoki, Keiji, 4,066,413, Cl. 23-254.00E.

Aoki, Sadashiro, to Koto Sangyo Kabushiki Kaisha. Universal joint. 4,065,941, Cl. 64-7.000.

Apaloo, Thomas L.; Garside, Wayne H.; and Berger, Isaac, to Carrier Corporation. Compressor lubricating oil heater control. 4,066,869, Cl. 219-490.000.

Apparatebau Gauting GmbH: *See—*
Euer, Hartmut; and Bartek, Gerhard, 4,065,974, Cl. 73-430.000.

Applied Data Research, Inc.: *See—*
Waks, David J.; and Futterweit, Adolf, 4,066,843, Cl. 179-8.00A.

Aqueduct, Inc.: *See—*
Lind, Charles F., Jr., 4,066,096, Cl. 137-504.000.

ARA, Incorporated: *See—*
Mazelsky, Bernard, 4,066,149, Cl. 188-1.00C.

Arai, Yasuo: *See—*
Kosaka, Yujiro; Uemura, Masaru; Kuroki, Hitoshi; Otomo, Kanji; Terauchi, Yoshiaki; and Arai, Yasuo, 4,066,810, Cl. 428-195.000.

Araki, Kenzi: *See—*
Uchida, Kuniki; Araki, Kenzi; Fukunaka, Shiro; and Kurihara, Takao, 4,066,474, Cl. 148-2.000.

Arbed F & G Drahtwerke Cologne GmbH: *See—*
Bockenhoff, Hermann-Josef; Schaeffer, Walter; and Kranz, Berthold, 4,066,477, Cl. 148-15.000.

Arcan, Mircea; Robin, Gordon; and Simkin, Ariel, to Ramot University Authority for Applied Research and Industrial Development Ltd. Force applicator including indicator. 4,066,082, Cl. 128-303.00R.

Arends, Thomas Clark; and Miller, Warren Hastings, Jr., to Harris Corporation. Mirror mount with beveled aperture for optical systems. 4,066,342, Cl. 350-288.000.

Armstrong Cork Company: *See—*
Shenk, Jay D., 4,066,805, Cl. 427-226.000.

Armstrong, Nelson W., to L. C. Company, Inc. Chromatographic septum having polyimide coating. 4,066,183, Cl. 215-247.000.

Armstrong, William A. Method for a low temperature oxygen electrode. 4,066,823, Cl. 429-41.000.

Arndt, Henry Clifford: *See—*
Woessner, Warren Dexter; Biddlecom, William Gerard; Arndt, Henry Clifford; Peruzzotti, George Peter; and Sih, Charles John, 4,066,834, Cl. 560-121.000.

Arneson, Hal, to Automation Industries, Inc. Electrical connector with arcuate detent means. 4,066,315, Cl. 339-89.00M.

Art Phyl Creations: *See—*
Hochman, Arthur, 4,066,169, Cl. 211-57.100.

Arvanigian, George B. Carton forming machine. 4,066,008, Cl. 93-49.00R.

Arway, George, to A. B. Dick Company. Noninterrupt ink transfer system for ink jet printer. 4,067,020, Cl. 346-75.000.

Arya, Satya Prakash, to General Atomic Company. Apparatus and method for assembling fuel elements. 4,066,534, Cl. 209-82.000.

Arya, Vishwa Prakash: *See—*
Nagarajan, Kuppuswamy; Arya, Vishwa Prakash; and George, Thomas, 4,066,778, Cl. 424-273.00R.

Asahi-Dow Limited: *See—*
Naito, Hirokuni; Yoshimura, Isao; Takao, Norito; and Kawame, Yasuta, 4,066,811, Cl. 428-220.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Enomoto, Shigeo, 4,067,031, Cl. 354-195.000.
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; Mita, Kunio; Kawasaki, Masahiro; and Mori, Chiharu, 4,067,023, Cl. 354-23.00D.
Urano, Fumio; and Umetsu, Junji, 4,067,033, Cl. 354-289.000.

Asai, Soichiro; Matsuishi, Tsutomu; Matsushita, Katsunobu; Ikeda, Shigeho; Kobayashi, Kaetsu; and Maruyama, Hiromasa, to Ajinomoto Co., Inc. Method of producing carbon source for fermentation. 4,066,502, Cl. 195-47.000.

ASEA Aktiebolaget: *See—*
Elvin, Sten, 4,066,141, Cl. 180-2.00R.

Ashida, Akira: *See—*
Takahashi, Kiyoshi; Takimoto, Hiroyuki; Yamada, Takashi; Itani, Takashi; Ashida, Akira; and Suzaki, Kuniyoshi, 4,066,963, Cl. 352-12.000.

Ashida, Kaneyoshi; Frisch, Kurt C.; and Kordomenos, Panagiotis, to Mitsubishi Chemical Industries Ltd. Oxazolidone catalyst. 4,066,628, Cl. 260-77.50R.

Ashland Oil, Inc.: *See—*
Hartlage, James A., 4,066,652, Cl. 260-289.0XA.
Myers, George D.; Walters, Paul W.; and Cottage, Robert L., 4,066,533, Cl. 208-153.000.

Asia American Industries Ltd.: *See—*
Yamazaki, Shogo, 4,067,027, Cl. 354-79.000.

Aspro, Inc.: *See—*
Devlin, Thomas A., 4,066,300, Cl. 303-96.000.

Asselin, Andre A.: *See—*
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,066,779, Cl. 424-274.000.
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,066,780, Cl. 424-274.000.

Associated Data Concepts: *See—*
Saylor, William H.; and Narey, James O., 4,067,006, Cl. 340-325.000.

Associated Portland Cement Manufacturers Limited, The: *See—*
Burke, Edward, 4,066,471, Cl. 106-104.000.
Shiel, Leslie Edward; and Jones, Kenneth Wilson, 4,066,469, Cl. 106-89.000.

Astra Chemical Products AB: *See—*
Smith, Roy Henry; and McAllan, Alexander Baxter, 4,066,750, Cl. 424-180.000.

Ataka, Hisanori: *See—*
Koide, Hiroshi; Iida, Katsuhiko; Ataka, Hisanori; and Homae, Taisaburo, 4,066,350, Cl. 353-27.00R.

Atanmo, Philip N.: *See—*
Blazek, William S.; Piwonka, Thomas S.; Jackson, James D.; and Atanmo, Philip N., 4,066,116, Cl. 164-17.000.

Ateliers de Constructions Mecaniques Seailles & Tison: *See—*
Tison, Eric, 4,066,016, Cl. 101-228.000.

Ateliers de la Motobecane: *See—*
Jaulmes, Eric, 4,065,945, Cl. 70-58.000.

Atkinson, Eulas R.; and Kemp, Willard E., to ACF Industries, Incorporated. Self compensating seat for a spherical plug valve. 4,066,240, Cl. 251-175.000.

Atlantic Richfield Company: *See—*
Erickson, Henry, 4,066,740, Cl. 423-628.000.
Simpson, Terry Lee, 4,065,929, Cl. 61-45.00D.
Spence, Andrew P., 4,066,297, Cl. 299-4.000.

Atlas Manufacturing, Inc.: *See—*
Wedel, Mark J., 4,066,308, Cl. 312-333.000.

Atlas Powder Company: *See—*
Fowler, Frank C., 4,066,514, Cl. 203-11.000.

Auhorn, Werner: *See—*
Scharf, Emil; Fikentscher, Rolf; Auhorn, Werner; and Streit, Werner, 4,066,494, Cl. 162-164.0EP.

Aumuller, Walter: *See—*
Weber, Helmut; Muth, Karl; Weyer, Rudi; Aumuller, Walter; and Haack, Erich, 4,066,639, Cl. 260-239.0BF.

Auriemma, Robert Sinbad. Underground drainage pipe. 4,065,925, Cl. 61-11.000.

Automation Electronics Corporation: *See—*
Giordano, John K., 4,066,847, Cl. 179-99.000.

Automation Industries, Inc.: *See—*
Arneson, Hal, 4,066,315, Cl. 339-89.00M.

Axelrod, Robert Jay, to General Electric Company. Stabilized polycarbonate composition. 4,066,611, Cl. 260-45.80A.

Ayerst, McKenna and Harrison Ltd.: *See—*
Bagli, Jehan F.; and Bogri, Tibor, 4,066,784, Cl. 424-305.000.
Demerson, Christopher A.; Humber, Leslie G.; Santroch, George; Dobson, Thomas A.; and Jirkovsky, Ivo, 4,066,763, Cl. 424-246.000.
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,066,779, Cl. 424-274.000.
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,066,780, Cl. 424-274.000.

Ayukawa, Buichiro, to Shikoku Paper Mfg. Co., Ltd. Method of purification of waste water by treatment with zirconium salt. 4,066,542, Cl. 210-51.000.

B. Braun Melsungen Aktiengesellschaft: *See—*
Breddin, Klaus; and Schremmer, Wolfgang, 4,066,360, Cl. 356-39.000.

B. F. Goodrich Company, The: *See—*
Chasar, Dwight William, 4,066,619, Cl. 260-45.95C.
Spaulding, David Chantrill, 4,066,583, Cl. 260-17.4SG.

Baatrup, Johannes Vagn; and Christensen, Thorkild, to Danfoss A/S. Hydraulic control means, particularly for vehicle steering means. 4,065,921, Cl. 60-385.000.

Baba, Kazuo: *See—*
Saito, Shinichi; Okaue, Asaya; Baba, Kazuo; and Tanaka, Shigeo, 4,066,718, Cl. 260-878.00B.

Babian, Gunther William; and Harris, Edward Bruce, to Union Carbide Corporation. Improved acrylate based radiation curable coating compositions containing nitrocellulose. 4,066,582, Cl. 260-17.00A.

Bachman, Paul L.; and Moskal, John J., to Horizons Incorporated, a division of Horizons Research Incorporated. Free radical photosensitive compositions with improved sensitivity and shelf life stability. 4,066,459, Cl. 96-45.200.

Backgard, Stig Gunnar Bengt: *See—*
Skoglund, Klas Axel Lennart; and Backgard, Stig Gunnar Bengt, 4,066,013, Cl. 100-53.000.

Baczek, Frank A.: *See—*
Emmett, Robert C., Jr.; Dicksa, James K.; Wojcik, Bruce C.; and Baczek, Frank A., 4,066,520, Cl. 204-108.000.

Badische Maschinenfabrik GmbH: *See—*
Dokoupil, Jiri; Zapfel, Horst; Gabelmann, Erich; and Breitwieser, Helmut, 4,065,943, Cl. 69-41.000.

Bagli, Jehan F.; and Bogri, Tibor, to Ayerst, McKenna and Harrison Ltd. Tropone derivatives. 4,066,784, Cl. 424-305.000.

Bahner, Randal E.; and Haws, Jay B. Locking stand for small, portable devices. 4,066,231, Cl. 248-13.000.

Bailey, David S.: *See—*
Mey, William; and Bailey, David S., 4,066,455, Cl. 96-1.50R.

Baitinger, William Frederick, Jr.: *See—*
Weyker, Robert George; and Baitinger, William Frederick, Jr., 4,066,391, Cl. 8-116.00P.

Baker, Charles E.; and Silverzweig, Abraham, to Elco Corporation. Method and apparatus for flat conductor cable termination. 4,066,319, Cl. 339-97.00R.

Balas, Salman Heskel; and Keiller, Clifton Quinton. Apparatus for playing a game. 4,066,263, Cl. 273-273.000.

Ball Corporation: *See—*
Scholes, Addison B.; Dollar, David L.; and Hurst, Robert L., 4,066,803, Cl. 427-26.000.

Ball, Dean M.; Fincher, Robert C.; and Orr, Clyde, Jr., to Micromeritics Instrument Corporation. Particle size separation by suspension flow in an unobstructed passageway. 4,066,536, Cl. 209-155.000.

Ballentine, Earle W. Apparatus for thawing frozen food. 4,066,011, Cl. 99-467.000.

Banoczi, Joseph A. Paint strainer. 4,066,557, Cl. 210-470.000.

Barbato, Mathew Martin: *See—*
Ackerman, Thomas Liddon; Barbato, Mathew Martin; and Vidmantas, Eugene, 4,065,965, Cl. 73-194.0EM.

Barber-Colman Company: *See—*
Boettner, Jon E., 4,066,725, Cl. 264-40.500.

Barding, Paul E. Anti-theft housing for vehicular communication equipment. 4,066,307, Cl. 312-242.000.

Bardonnet, Claude; Brun, Robert; and Pages, Michel, to Rhone-Poulenc Industries. Apparatus with supported tubular membranes for the treatment of fluids. 4,066,553, Cl. 210-321.00R.

Bardwell, Francis G.; and Dudek, Edmund C., to Thor Power Tool Company. Control circuit for a power tool. 4,066,942, Cl. 318-434.000.

Bargar Metal Fabricating Co.: *See—*
Penczak, John P., 4,065,896, Cl. 52-220.000.

Barlow, Roland J., to Ex-Cell-O Corporation. Actuator seal assembly. 4,066,007, Cl. 92-125.000.

Barmeier, Harold J., Jr.: *See—*
Walters, Chester H.; Barmeier, Harold J., Jr.; and Sullivan, Greig E., 4,066,545, Cl. 210-71.000.

Barnard, Dominick Paul Edmund, to Smiths Industries Limited. Speed sensing. 4,066,961, Cl. 324-163.000.

Baron, Arthur L.: *See—*
Rawlings, Herbert L.; and Baron, Arthur L., 4,066,617, Cl. 260-45.80A.

Bartek, Gerhard: *See—*
Euer, Hartmut; and Bartek, Gerhard, 4,065,974, Cl. 73-430.000.

Barth, Wayne E., to Pfizer Inc. 2-[(Carboxy)(triphenylmethylamino)-methyl]-5,5-dimethyl-3-thiazoline. 4,066,657, Cl. 260-306.70R.

BASF Aktiengesellschaft: *See—*
Pommer, Ernst-Heinrich; Hagen, Helmut; and Fleig, Helmut, 4,066,775, Cl. 424-270.000.
Scharf, Emil; Fikentscher, Rolf; Auhorn, Werner; and Streit, Werner, 4,066,494, Cl. 162-164.0EP.

BASF Wyandotte Corporation: *See—*
Falkenstein, Georg; Fahrbach, Gerhard; and Wulff, Harald, 4,066,580, Cl. 260-2.5AW.

Bashkovich, Alexandr Pavlovich; Zimnukhova, Evgenia Semenovna; Prokopovich, Agnessa Vladimirovna; Polatovshaya, Olga Grigorievna; Pronina, Maria Ivanovna; Kulbakh, Valter Osvaldovich; Rivkina-Pevtsova, Khasya Ionovna; and Grinberg, Grigory Efimovich. Enzyme of hydrolytic action, enzymatic preparation, method for preparing both and their uses. 4,066,503, Cl. 195-62.000.

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Columberg, Alfred, 4,066,571, Cl. 252-431.00C.
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Baum, Werner: *See—*
Frankle, Helmut; and Baum, Werner, 4,066,137, Cl. 175-14.000.

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Van Exel, Gerrit A., 4,066,329, Cl. 350-77.000.

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Achter, Eugene K., 4,066,361, Cl. 356-41.000.

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Bockelmann, Wolfgang; Nieder-Vahrenholz, Hans-Georg; Niederprum, Hans; and Jonas, Heinz, 4,066,734, Cl. 423-61.000.
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Blank, Karl, 4,066,921, Cl. 310-61.000.
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Schwarz, Martin, 4,066,100, Cl. 137-625.300.
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Cox, James P.; and Beach, Robert W., 4,066,400, Cl. 21-60.50R.

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Leonard, Byron Herbert, Jr., 4,065,846, Cl. 29-407.000.

Bechtel, Jon H., to Robertshaw Controls Company. Temperature control circuit with two independent switch outputs. 4,066,867, Cl. 219-483.000.

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Wilner, Leslie B., 4,065,970, Cl. 73-727.00R.

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Sieber, Axel, 4,066,581, Cl. 260-8.000.

Beilman, John L., to Calspan Corporation. Fluid speed indicating apparatus and densitometer. 4,065,957, Cl. 73-30.000.

Beisner, Klaus: *See—*
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Belcher, Ralph L.; and Wood, Harry R. Chemical change measuring apparatus. 4,066,897, Cl. 250-358.00R.

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King, Ralph J.; Belke, William H.; and Dearlove, William E., 4,066,723, Cl. 264-34.000.

Bell & Howell Company: *See—*
Flint, John R., 4,066,349, Cl. 353-25.000.
Karp, Robert S.; and Flint, John R., 4,066,872, Cl. 353-26.00A.

Bell Telephone Laboratories, Incorporated: *See—*
Allen, Jont Brandon, 4,066,842, Cl. 179-1.00P.
Rollings, Robert William, 4,066,316, Cl. 339-91.00R.

Belleau, Bernard R.; Doyle, Terrence W.; Luh, Bing Yu; and Conway, Terry T., to Bristol-Myers Company. O-2-Isocephem-4-carboxylic acid derivatives as antibacterial agents. 4,066,831, Cl. 544-105.000.

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Panov, Vadim Ivanovich; Tkach, Grigory Anatolievich; Tomenko, Viktor Mikhailovich; Zolotukhin, Boris Mikhailovich; and Belyaev, Erik Konstantinovich, 4,066,416, Cl. 23-283.000.

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Neu, Gustav; and Bemmerl, Hans-Ferdinand, 4,065,931, Cl. 61-45.00D.

Bender, Lawrence C. Removable toggle link. 4,065,833, Cl. 24-201.00A.

Bendix Corporation, The: *See—*
Eastman, James M., 4,066,002, Cl. 91-36.000.
Korte, Donald R., Jr., 4,066,945, Cl. 318-681.000.

Bent, Keith Joseph; and Turner, John Angus William, to Imperial Chemical Industries Limited. Process for combating fungi. 4,066,786, Cl. 424-313.000.

Bentz, Francis: *See—*
Wolf, Gerhard Dieter; Miessen, Ralf; Kunzel, Hans Egon; and Bentz, Francis, 4,066,396, Cl. 8-178.00A.

Bentz, Jack. Adjustable form stake assembly. 4,066,237, Cl. 249-213.000.

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Meggs, Daniel H.; and Beny, Janos, 4,065,986, Cl. 81-128.000.

Beregi, Laszlo; Hugon, Pierre; Pascaud, Xavier; and Poignant, Jean-Claude, to Science Union et Cie., Societe Francaise de Recherche Medicale. N-substituted-2-aminomethyl-3-azabicyclo(3,3,0)octane compounds. 4,066,662, Cl. 260-326.850.

Berg, Jeffrey, to Johnson & Johnson. Disposable electrode. 4,066,078, Cl. 128-2.06E.

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Apaloo, Thomas L.; Garside, Wayne H.; and Berger, Isaac, 4,066,869, Cl. 219-490.000.

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Bernfeld, Georg Josef. Wet magnetic separation of materials. 4,066,537, Cl. 209-223.00R.

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Connick, Francis G.; and Bernholdt, Harry F., 4,066,790, Cl. 426-8.000.

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Nair, Vijay Gopalan; Joseph, Joseph Peter; and Bernstein, Seymour, 4,066,829, Cl. 536-103.000.

Bernt, Erich: *See—*
Rauscher, Elli; Bernt, Erich; Gruber, Wolfgang; and Determann, Helmut, 4,066,508, Cl. 195-99.000.

Berry, Arthur E., to Berry, Madeline E. Fishing down-rigger vane and release. 4,065,869, Cl. 43-43.120.

Berry, Madeline E.: *See—*
Berry, Arthur E., 4,065,869, Cl. 43-43.120.

Bertaux, Jean-Loup; and Quessette, Jacques Alain, to Agence Nationale de Valorisation de la Recherche Anvar. Method of measurement of the concentration of a substance contained in a gas and devices for carrying out said method. 4,066,904, Cl. 250-372.000.

Besenmatter, Walter; Muszumanski, Trude; and Wendisch, Irmgard, to Vockenhuber, Karl; and Hauser, Raimund. Basic lens assembly for series of zoom objectives of different varifocal ratios. 4,066,340, Cl. 350-184.000.

Besso, Michael M.; and Saferstein, Lowell, to Celanese Corporation. Inverse interfacial polymerization for preparing certain halogenated aromatic polyesters. 4,066,623, Cl. 260-47.00C.

Beyer, Ralph E.: *See—*
Phillips, Carmen S.; Beyer, Ralph E.; and Sepich, Gerald E., 4,065,914, Cl. 56-341.000.

BFG Glassgroup: *See—*
Olink, Jan; and Dela Ruye, Jacques, 4,066,815, Cl. 428-336.000.

BICC Limited: *See—*
Moore, Alexander Joseph; Taylor, David Alexander; and Greene, David James, 4,066,987, Cl. 333-95.00R.

Bicking, John B.: *See—*
Cragoe, Edward J., Jr.; Bicking, John B.; and Smith, Robert L., 4,066,675, Cl. 260-400.000.
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Woessner, Warren Dexter; Biddlecom, William Gerard; Arndt, Henry Clifford; Peruzzotti, George Peter; and Sih, Charles John, 4,066,834, Cl. 560-121.000.

Bierenfeld, Herbert H.; McGonigal, Charles; Horton, Chauncey M., Jr.; and Kelsey, John A., to Western Electric Company, Inc. Electrical conductor terminating system. 4,066,317, Cl. 339-91.00R.

Binard, Edouard, to N. V. Bekaert S. A. Method for making tubular welded wire screens. 4,066,202, Cl. 228-173.00E.

Bird, Thomas Lewis: *See—*
Jones, Ivor Wynn; Robinson, Graham; and Bird, Thomas Lewis, 4,066,826, Cl. 429-104.000.

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Reinhard, Clyde J., 4,066,974, Cl. 330-10.000.

Black Products Company: *See—*
Lau, Erwin M., 4,066,108, Cl. 141-68.000.

Blackhall, Alexander; Brydon, Donald Lithgow; and Seddon, John David, to Imperial Chemical Industries Limited. Oxadiazole polymers. 4,066,601, Cl. 260-30.80R.

Blackwood, Robert K.; and Stephens, Charles R., Jr., to Pfizer Inc. 4-Hydroxy-4-dedimethylamino-tetracyclines. 4,066,694, Cl. 260-559.0AT.

Blank, Karl, to BBC Brown Boveri & Company Limited. Exciter-current lead-through bolt interconnecting rotor shaft-enclosed lead-in conductor bar and terminal conductor bar leading to rotor winding. 4,066,921, Cl. 310-61.000.

Blanton, William A., Jr., to Chevron Research Company. Emerald green alumina. 4,066,573, Cl. 252-439.000.

Blazek, William S.; Piwonka, Thomas S.; Jackson, James D.; and Atanmo, Philip N., to TRW Inc. Mold assembly and method of making the same. 4,066,116, Cl. 164-17.000.

Bleckmann, Richard. Method of joining metal parts. 4,066,201, Cl. 228-115.000.

Bleicher, Manfred: *See—*
Wanner, Karl; Hahner, Reinhard; Schmid, Wolfgang; Hansel, Gernot; and Bleicher, Manfred, 4,066,136, Cl. 173-48.000.

Blick, John S., III; and Fuller, Ralph N., to Monogram Industries, Inc. Portable building structure. 4,065,885, Cl. 52-143.000.

Blohm, Thomas R.; Grisar, J. Martin; and Parker, Roger Alan, to Richardson-Merrell Inc. Substituted benzaldehyde hypolipidemic agents. 4,066,788, Cl. 424-333.000.

Bloom, Melvin S.; and Fico, Sally S., to Eastman Kodak Company. Photosensitive material comprising polyacetylenic amine salts. 4,066,676, Cl. 260-402.500.

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Oeser, Henning; and Ahrens, Ulrich, 4,066,549, Cl. 210-177.000.

Bobbe, Richard M., to Xerox Corporation. Half tone imaging system. 4,066,353, Cl. 355-4.000.

Bochumer Eisenhutte Heintzmann GmbH & Co.: *See—*
Neu, Gustav; and Bemmerl, Hans-Ferdinand, 4,065,931, Cl. 61-45.00D.
Spies, Klaus, 4,065,930, Cl. 61-45.00D.

Bockelmann, Wolfgang; Nieder-Vahrenholz, Hans-Georg; Nieder-

prum, Hans; and Jonas, Heinz, to Bayer Aktiengesellschaft. Alkaline disintegration of chromites. 4,066,734, Cl. 423-61.000.

Bockenhoff, Hermann-Josef; Schaeffer, Walter; and Kranz, Berthold, to Arbed F & G Drahtwerke Cologne GmbH. Method of maintaining temperature of salt bath during quenching of steel wire. 4,066,477, Cl. 148-15.000.

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Ceska, Miroslav, 4,066,509, Cl. 195-103.50R.
Rauscher, Elli; Bernt, Erich; Gruber, Wolfgang; and Determann, Helmut, 4,066,508, Cl. 195-99.000.

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Krasnobajew, Victor; and Boeniger, Regula, 4,066,504, Cl. 195-63.000.

Boettner, Jon E., to Barber-Colman Company. Injection molding control method. 4,066,725, Cl. 264-40.500.

Bogri, Tibor: *See*—
Bagli, Jehan F.; and Bogri, Tibor, 4,066,784, Cl. 424-305.000.

Bohm, Leslie Eric: *See*—
Jackson, W. Shaun; and Bohm, Leslie Eric, 4,066,196, Cl. 224-30.00A.

Bolger, Justin C., to Amicon Corporation. Unitary curable resin compositions. 4,066,625, Cl. 260-59.00R.

Boller, Arthur; Cereghetti, Marco; and Scherrer, Hanspeter, to Hoffman-La Roche Inc. Phenyl-pyrimidines. 4,066,570, Cl. 252-299.000.

Borchard, Heinz; Grottker, Gunter; and Thun, Peter, to TED Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec. Disc recording provided with legible matter. 4,066,268, Cl. 274-42.00R.

Borel, Joseph; Lacour, Jacques; and Merckel, Gerard, to Commissariat a l'Energie Atomique. Method of fabrication of a charge-coupled device. 4,065,847, Cl. 29-578.000.

Borg-Warner Corporation: *See*—
Fenton, John William; Lee, Jerry Stevenson; and Buist, Richard James, 4,065,936, Cl. 62-3.000.
Gibbs, James Kiel, 4,066,157, Cl. 192-3.240.

Bork, Siegfried; and Sam, Georg, to Hoechst Aktiengesellschaft. Polyethylene mixture for the manufacture of semiconductive films for bags and sacks. 4,066,576, Cl. 252-511.000.

Borman, Willem F. H.; and Reilly, Eugene P., to General Electric Company. Production of polyesters. 4,066,627, Cl. 260-75.00M.

Boron, Alfred: *See*—
Karp, Alexander; and Boron, Alfred, 4,066,107, Cl. 141-11.000.

Bosso, Joseph F.: *See*—
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Botros, Raouf, to American Color & Chemical Corporation. Disazo dyes derived from 1-acyl-2,4-dihydroxybenzenes and metallized polyolefin dyed therewith. 4,066,388, Cl. 8-41.00D.

Bourdois, Claude; Glachet, Charles; Marchal, Paul; and Vertut, Jean, to Commissariat a l'Energie Atomique. Container for radioactive objects. 4,066,909, Cl. 250-497.000.

Bourrabier, Guy: *See*—
Diamand, Felix; Bourrabier, Guy; and Antoine, Robert, 4,066,979, Cl. 331-56.000.

Bowbin, John F., to Miller Fluid Power Corporation. Nuclear cylinder seal construction. 4,065,852, Cl. 308-3.500.

Bowker, Harold: *See*—
Nobbs, William Harry; Bowker, Harold; and Tyburski, Peter Frank, 4,066,197, Cl. 224-42.010.

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Witkin, Donald E.; and Bowles, Arnold G., 4,066,868, Cl. 219-486.000.

Boyce, Clive B. C.; and Webb, Shirley B., to Shell Oil Company. 3-Pyridylisoxazolidine fungicides. 4,066,770, Cl. 424-263.000.

Brachthauser, Kunibert; Ramesohl, Hubert; Beisner, Klaus; and Herchenbach, Horst, to Klockner-Humboldt-Deutz Aktiengesellschaft. Method for the treatment of finely grained material, particularly for the precalcining of cement. 4,066,470, Cl. 106-100.000.

Bradbury, Wilburn F., to Addressograph-Multigraph Corporation. Document transport system. 4,066,255, Cl. 271-265.000.

Bradley, Robert P.: *See*—
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Brake, Robert D. Mailbox signal kit. 4,066,209, Cl. 232-35.000.

Brammall, Inc.: *See*—
Loynes, Leslie M.; Walters, Darrel H.; and Penick, Clarence A., Jr., 4,065,946, Cl. 70-58.000.

Brandstaetter, David Peter; and Harris, James Marion, to Texas Instruments Incorporated. Workspace addressing system. 4,067,058, Cl. 364-200.000.

Brandt, Edison R. Subterranean irrigation system. 4,065,926, Cl. 61-13.000.

Branemark, Per Ingvar; and Ekenstam, Bo Thuresson Af. Bone prosthesis and method of forming a bone joint. 4,065,817, Cl. 3-1.910.

Brazhnikov, Nikolai Ivanovich: *See*—
Krylova, Eleonora Dmitrievna; and Brazhnikov, Nikolai Ivanovich, 4,065,958, Cl. 73-53.000.

Brdr. Schur International A/S, J. W. Schursevej: *See*—
Jorgensen-Beck, Frode; and Lambach, Heinrich Wilhelm, 4,066,207, Cl. 229-17.0SC.

Breddin, Klaus; and Schremmer, Wolfgang, to B. Braun Melsungen Aktiengesellschaft. Device for measuring and recording spontaneous blood platelet aggregation in platelet-rich citrated plasma. 4,066,360, Cl. 356-39.000.

Bredlau, Kenneth A. Amusement device. 4,066,265, Cl. 273-153.00R.

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Brentham, Jerry D. Neck exerciser. 4,066,259, Cl. 272-94.000.

Bressler, David E.: *See*—
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Yukuta, Toshio; Ohashi, Takashi; Kojima, Minoru; Suzuki, Akira; and Taniguchi, Yoshiko, 4,066,579, Cl. 260-2.5AP.

Bright, Charles R. Hollow plastic coop dowels with wood core. 4,066,042, Cl. 119-19.000.

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Belleau, Bernard R.; Doyle, Terrence W.; Luh, Bing Yu; and Conway, Terry T., 4,066,831, Cl. 544-105.000.
Menard, Marcel; Lim, Gary M. F.; and Conway, Terry T., 4,066,832, Cl. 544-105.000.

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Waters, John M., 4,065,856, Cl. 33-287.000.

Brittain, David Robert; Brown, Edward Douglas; Hepworth, Walter; and Stacey, Gilbert Joseph, to Imperial Chemical Industries Limited. Alkanoic acid 2-quinoline derivatives. 4,066,651, Cl. 260-287.00K.

Broodman, Johannus Jacobus, to B.V. Koninklijke Maatschappij "De Schelde". Method of welding a pipe to a pipe plate. 4,066,861, Cl. 219-61.000.

Brown, Boveri & Cie, A.G.: *See*—
Csutor, Endre, 4,066,990, Cl. 335-174.000.

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Brown, Henry C.: *See*—
Ray, Louis M., Jr.; Pease, Leo L.; and Brown, Henry C., 4,066,296, Cl. 298-22.00J.

Brown, Richard E., to Warner-Lambert Company. Intermediates in the preparation of indolobenzoxazepines. 4,066,660, Cl. 260-326.14R.

Brown, Richard L., to Lo-Rise Elevator Company. Hydraulically-actuatable elevator system. 4,066,148, Cl. 187-17.000.

Brown, Robert L., to United States of America, Energy Research and Development Administration. Cryogenic expansion joint for large superconducting magnet structures. 4,066,496, Cl. 176-3.000.

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Cuthbert, William Livingstone; and Brown, Thomas, 4,066,184, Cl. 220-9.0LG.

Brun, Robert: *See*—
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Rostocil, Charles Edward, 4,066,000, Cl. 89-198.000.

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Bruschi, Barbara J., to Eastman Kodak Company. Multilayer analytical element. 4,066,403, Cl. 23-230.00B.

Bryden, Joseph E., to Raytheon Company. Adaptive compass drive system. 4,067,007, Cl. 340-347.0SY.

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Blackhall, Alexander; Brydon, Donald Lithgow; and Seddon, John David, 4,066,601, Cl. 260-30.80R.

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Cines, Martin R.; and Buchanan, Ben B., 4,066,538, Cl. 210-15.000.

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Jungpeter, Raymond R.; and Buchholz, Jean L., 4,065,838, Cl. 26-94.000.

Buchsel, Christian K. E. Mezzanine structure for wide-bodied passenger aircraft. 4,066,227, Cl. 244-118.00P.

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Allen, David O.; and Wombold, Harry A. E., 4,066,182, Cl. 215-256.000.
Robinson, William H.; Allen, David O.; and Wombold, Harry A. E., 4,066,181, Cl. 215-256.000.

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Hannum, Joseph R.; and Santos, Gerard R., 4,066,489, Cl. 156-258.000.

Buist, Richard James: *See*—
Fenton, John William; Lee, Jerry Stevenson; and Buist, Richard James, 4,065,936, Cl. 62-3.000.

Buller, Paul L.; Chapman, William L.; Thomas, Bobby J.; and Fowler, James C., to United States of America, Interior. Seismic mine monitoring system. 4,066,992, Cl. 340-15.5MC.

Bunda, Tsuchio: *See*—
Takeuchi, Masaharu; Igarashi, Isemi; and Bunda, Tsuchio, 4,066,450, Cl. 75-229.000.

Bunge, Hans-Henning, to Ciba-Geigy Corporation. Water-soluble dye composition. 4,066,595, Cl. 260-29.40R.

Burch, Derek Ernest: *See—*
King, Kenneth Gordon; and Burch, Derek Ernest, 4,066,916, Cl. 307-253.000.

Burdyn, Ralph F.: *See—*
Waite, Jerry M.; and Burdyn, Ralph F., 4,066,126, Cl. 166-273.000.

Burger, Manfred R.; Gagel, Ernst; Kalmovicz, Rudolf; and Prechtl, Alfred. Method to transfer heat or refrigerant and heat pump for practical application of this method. 4,065,937, Cl. 62-89.000.

Burgess, Roy. Menu planner. 4,065,863, Cl. 40-490.000.

Burgin, Kermit H. Rotary floor grain bin. 4,065,891, Cl. 52-65.000.

Burk, Claud A.: *See—*
Gaspar, Randle; and Burk, Claud A., 4,066,899, Cl. 250-358.00P.

Burke, Edward, to Associated Portland Cement Manufacturers Limited, The. Constructional cement. 4,066,471, Cl. 106-104.000.

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Beck, Christian A.; Ross, William A.; and Burke, James E., 4,066,220, Cl. 242-55.000.

Burr, Robert Page; Morino, Ronald; and Keogh, Raymond J., to Kollmorgen Technologies Corporation. Method of making multi-wire electrical interconnecting member having a multi-wire matrix of insulated wires mechanically terminated thereon. 4,065,850, Cl. 29-625.000.

Burrow, Reginald Edward Dowton; and Plaskitt, David Edmund, to Taylor Woodrow Construction Limited. Articulated joints for deep water installations. 4,065,935, Cl. 61-95.000.

Busch, Wilhelm: *See—*
Gierse, Franz-Josef; Bastert, Carl-Christian; and Busch, Wilhelm, 4,065,837, Cl. 26-9.000.

Buschor, Karl; and Ribnitz, Peter, to Gema AG Apparatebau. Apparatus for electrostatically applying coating material to articles and the like. 4,066,041, Cl. 118-629.000.

Buthmann, Hans-Peter, to Hochtemperatur-Kernkraftwerk GmbH (HKG) Gemeinsames Europaisches Unternehmen. Method of cooling the ceiling reflector in a nuclear reactor. 4,066,499, Cl. 176-38.000.

Buxbaum, Lothar: *See—*
Breitenfellner, Franz; Buxbaum, Lothar; and Leidig, Karl, 4,066,607, Cl. 260-40.00R.
Herzog, Hans; Buxbaum, Lothar; Kainmuller, Thomas; and Habermeier, Jurgen, 4,066,626, Cl. 260-75.00N.

Buzzi, Leo; and Malobabic, Peter, to U.S. Philips Corporation. Reciprocating vibrating drive. 4,065,977, Cl. 74-49.000.

B.V. Koninklijke Maatschappij "De Schelde": *See—*
Broodman, Johannus Jacobus, 4,066,861, Cl. 219-61.000.

C & E Enterprises, Inc.: *See—*
Crew, Robert T., 4,065,961, Cl. 73-117.300.

C. F. Scheer & Cie: *See—*
Fritsch, Rudolf Paul, 4,066,097, Cl. 137-563.000.

Cady, Norman F.: *See—*
Caron, James O.; Caron, Fred J.; and Cady, Norman F., 4,066,375, Cl. 404-121.000.

Caine, Gerard H., to Sundstrand Corporation. Combined pump and self-cleaning centrifugal contamination separator. 4,066,552, Cl. 210-304.000.

Caldecott, Ross: *See—*
Young, Jonathan D.; and Caldecott, Ross, 4,066,970, Cl. 328-67.000.

Callingham, Martin; and Curry, Kenneth Vasey, to Lever Brothers Company. Reducing the drying time of hair with fluorine-containing vinyl polymers. 4,066,746, Cl. 424-62.000.

Calspan Corporation: *See—*
Beilman, John L., 4,065,957, Cl. 73-30.000.

Calvert, Rodney K.; and Landrum, Charles Rabun, to Mead Corporation, The. Method for opening and erecting cartons. 4,066,009, Cl. 93-53.00M.

Campbell, James B. Ski clamping apparatus. 4,066,250, Cl. 269-43.000.

Canada Wire and Cable Limited: *See—*
Dudley, Michael A.; Parthasarathy, Mellapalayam R.; and Nerthersole, Douglas C., 4,066,040, Cl. 118-629.000.

Canadian Patents and Development Limited: *See—*
Hanessian, Stephen, 4,066,753, Cl. 424-181.000.
Poussart, Denis; and Ganguly, Udaya, 4,067,060, Cl. 364-553.000.

Canon Kabushiki Kaisha: *See—*
Takahashi, Kiyoshi; Takimoto, Hiroyuki; Yamada, Takashi; Itani, Takashi; Ashida, Akira; and Suzaki, Kuniyoshi, 4,066,963, Cl. 352-12.000.
Toyama, Masamichi; Takigawa, Tomoshi; Hirata, Noritsugu; and Ishikawa, Kazuo, 4,066,346, Cl. 352-72.000.
Yoshikawa, Ryoichi; Oda, Teruhisa; Tanaka, Kunio; Iura, Yukio; Fukushima, Tadahide; and Aizawa, Hiroshi, 4,067,032, Cl. 354-288.000.

Capozza, Richard C., to Alza Corporation. Polymeric orthoesters housing beneficial drug for controlled release therefrom. 4,066,747, Cl. 424-78.000.

Carli, Renzo, to Carrozzeria Pininfarina S.p.A. Automobile with sunshine roof. 4,066,292, Cl. 296-137.00C.

Carlin, Joseph T.; Ware, James W.; Mills, Melvin E., Jr.; and Wells, John A., to Texaco Inc. Salinity tolerant surfactant oil recovery process. 4,066,124, Cl. 166-252.000.

Carlson, David John, to RCA Corporation. Remote control transmitter with an audible battery life indicator. 4,067,000, Cl. 340-171.00R.

Carlsson, Hakan Hasse: *See—*
Haglund, Kjell; and Carlsson, Hakan Hasse, 4,066,035, Cl. 115-34.00R.

Caron Compactor Company: *See—*
Caron, James O.; Caron, Fred J.; and Cady, Norman F., 4,066,375, Cl. 404-121.000.

Caron, Fred J.: *See—*
Caron, James O.; Caron, Fred J.; and Cady, Norman F., 4,066,375, Cl. 404-121.000.

Caron, James O.; Caron, Fred J.; and Cady, Norman F., to Caron Compactor Company. Replacement cap for compactor wheel. 4,066,375, Cl. 404-121.000.

Caron, LaVerne Andrew; Tomczak, Lawrence William; and Crall, Frederick William, to Chrysler Corporation. Transducer circuits. 4,066,054, Cl. 123-117.00R.

Carrier Corporation: *See—*
Apaloo, Thomas L.; Garside, Wayne H.; and Berger, Isaac, 4,066,869, Cl. 219-490.000.
Condrac, Edward J., 4,066,949, Cl. 324-262.000.

Carroll, Clifford Charles, to Milliken Research Corporation. Textile materials having improved elasticity and method for producing same. 4,066,397, Cl. 8-192.000.

Carrozzeria Pininfarina S.p.A.: *See—*
Carli, Renzo, 4,066,292, Cl. 296-137.00C.

Carson, William S. Container-dumping apparatus. 4,066,178, Cl. 214-313.000.

Carter, Efton T. Carburetor air intake velocity stack. 4,066,720, Cl. 261-44.00R.

Carter, Elbert P., to Du Pont de Nemours, E. I., and Company. Apparatus and method for performing photometric analysis. 4,066,362, Cl. 356-180.000.

Carter, Sidney T., to A-T-O Inc. Adhesive applying apparatus and method. 4,066,808, Cl. 427-428.000.

Caruso, Fred A.: *See—*
Long, Robert B.; Caruso, Fred A.; DeFeo, Richard J.; and Walker, David G., 4,066,679, Cl. 260-438.100.

Cason, Charles M., Sr.; and Cason, Charles M., III. Voting system. 4,066,871, Cl. 235-54.00F.

Cason, Charles M., III: *See—*
Cason, Charles M., Sr.; and Cason, Charles M., III, 4,066,871, Cl. 235-54.00F.

Cassano, James R.: *See—*
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,066,254, Cl. 271-236.000.

Cassella Farbwerke Mainkur Aktiengesellschaft: *See—*
Raabe, Thomas; Grawinger, Otto; Scholtholt, Josef; Nitz, Rolf-Eberhard; and Schraven, Eckhard, 4,066,768, Cl. 424-263.000.

Castronovo, Robert Frank: *See—*
Nieman, Charles Wayne; Turkovich, Robert Peter; and Castronovo, Robert Frank, 4,066,187, Cl. 222-57.000.

Caterpillar Tractor Co.: *See—*
Hall, Lowell R., 4,066,239, Cl. 251-31.000.
King, Ralph J.; Belke, William H.; and Dearlove, William E., 4,066,723, Cl. 264-34.000.
Linne, Terry D., 4,066,269, Cl. 277-228.000.
Moen, Lowell J., 4,066,422, Cl. 51-309.00R.
Stedman, Robert N., 4,066,119, Cl. 165-41.000.

Catini, Stefano: *See—*
Faraci, Rocco; Rescalli, Carlo; and Catini, Stefano, 4,066,713, Cl. 260-677.00A.

Celanese Corporation: *See—*
Besso, Michael M.; and Saferstein, Lowell, 4,066,623, Cl. 260-47.00C.
Edelman, Robert, 4,066,629, Cl. 260-77.50R.
Hughes, O. Richard, 4,066,705, Cl. 260-604.0HF.

Cellai, Marino: *See—*
Cossutta, Giuseppe; and Cellai, Marino, 4,066,839, Cl. 174-52.0PE.

Center, Dale: *See—*
McBride, La Vaughn R.; Clark, Jack D.; and Center, Dale, 4,066,605, Cl. 260-37.0EP.

Central Glass Company, Limited: *See—*
Mohri, Yoshio; Hiroishi, Takashi; Sano, Kinzi; Huruya, Koichi; Muramoto, Tadashi; and Tao, Masato, 4,066,465, Cl. 106-50.000.

Central Sprinkler Corporation: *See—*
Anderson, James R., 4,066,129, Cl. 169-37.000.

Centre Stephanois de Recherches: *See—*
Michalon, Daniel; and Rolin, Pierre, 4,066,161, Cl. 198-334.000.

Cereghetti, Marco: *See—*
Boller, Arthur; Cereghetti, Marco; and Scherrer, Hanspeter, 4,066,570, Cl. 252-299.000.

Ceska, Miroslav, to Boehringer Mannheim GmbH. Detection of hydrolyzing enzymes. 4,066,509, Cl. 195-103.50R.

Chambers, Ramon P.; Sanders, David E.; and Gordy, Robert S., to E-Systems, Inc. Digitized AGC amplifier with gain hysteresis circuit. 4,066,977, Cl. 330-129.000.

Champan, Louis W.; and Perkins, Arthur T., to Melco. Combined rotary dial and touch-tone telephone decoding system. 4,066,846, Cl. 179-16.0EC.

Chang, Hsu, to International Business Machines Corporation. Field access of bubble domain lattice. 4,067,002, Cl. 365-43.000.

Chang, Wen-Hsuan: *See—*
Scriven, Roger L.; and Chang, Wen-Hsuan, 4,066,591, Cl. 260-29.2TN.

Chang, Yew C.; Ovshinsky, Stanford R.; and Citkowski, Ronald W., to Energy Conversion Devices, Inc. Imaging and recording of information utilizing tellurium tetrahalide. 4,066,460, Cl. 96-48.00R.

Chapman, Arthur J. Bar jointing members. 4,066,371, Cl. 403-218.000.

Chapman, Orville L.: *See—*
Napier, Roger P.; and Chapman, Orville L., 4,066,719, Cl. 260-970.000.

Chapman, William L.: *See—*
Buller, Paul L.; Chapman, William L.; Thomas, Bobby J.; and Fowler, James C., 4,066,992, Cl. 340-15.5MC.

Charles Stark Draper Laboratory, Inc., The: *See—*
Cox, Duncan B., Jr.; and Lee, William H., 4,066,978, Cl. 331-1.00A.

Chasar, Dwight William, to B. F. Goodrich Company, The. 4-Hydroxydiphenyl sulfoxide compositions. 4,066,619, Cl. 260-45.95C.

Chase-Shawmut Company, The: *See—*
Kozacka, Frederick J., 4,065,849, Cl. 29-623.000.

Cheetham, Graham: *See—*
Sheasby, Peter Geoffrey; and Cheetham, Graham, 4,066,816, Cl. 428-336.000.

Chemed Corporation: *See—*
Hwa, Chih Ming, 4,066,398, Cl. 21-2.70A.

Chemische Werke Huis Aktiengesellschaft: *See—*
Schroeder, Manfred, 4,066,691, Cl. 260-531.00R.

Chen, Wu-Chi. Process for recovering hydrogen and elemental sulfur from hydrogen sulfide and/or mercaptans-containing gases. 4,066,739, Cl. 423-571.000.

Chevron Research Company: *See—*
Blanton, William A., Jr., 4,066,573, Cl. 252-439.000.
Tamm, Paul W., 4,066,574, Cl. 252-439.000.

Chia, E. Henry, to Southwire Company. Method of producing a continuously processed copper rod. 4,066,475, Cl. 148-3.000.

Chiarolla, Victor D. Filter needle. 4,066,079, Cl. 128-218.00N.

Chicago Fire Brick Company: *See—*
Rechter, Harold L., 4,066,467, Cl. 106-56.000.

Chicago Fittings Corporation: *See—*
Struck, Leslie G., 4,066,283, Cl. 285-53.000.

Chiklis, Charles K., to Polaroid Corporation. Transparent supports for photographic products. 4,066,814, Cl. 428-333.000.

Chladil, Joseph J., Sr., to Koss Corporation. Rotary-type control for headphone earpiece. 4,066,849, Cl. 179-178.000.

Chlystun, Walter K. Container with collapsible pouring spout and improved reclosing means. 4,066,190, Cl. 222-529.000.

Choca, Monica E., to Nalco Chemical Company. Phospha-alumina gel and method of preparation. 4,066,572, Cl. 252-437.000.

Chollet, Jacques Antoine Leon Francois. Silicate-containing flame-resistant adhesive composition. 4,066,463, Cl. 106-15.0FP.

Chomerics, Inc.: *See—*
White, James N.; and Seeger, Richard E., 4,066,851, Cl. 200-5.00A.

Chou, Shih-Toon, to Ralston Purina Company. Slow release bolus. 4,066,754, Cl. 424-229.000.

Chovan, Stephan, to Societe Cyberson. Device for visually displaying luminous patterns. 4,065,865, Cl. 40-444.000.

Chow, Kung C., to Westinghouse Electric Corporation. Active symmetrical component sequence filter. 4,067,053, Cl. 361-76.000.

Christ, Gunther: *See—*
Liebscher, Gunther; and Christ, Gunther, 4,066,151, Cl. 188-5.000.

Christensen, Thorkild: *See—*
Baatrup, Johannes Vagn; and Christensen, Thorkild, 4,065,921, Cl. 60-385.000.

Christie, Nick J.; Antisavage, Joseph P.; and Brupbacher, Eugene E. Stable hydrosulfite compositions. 4,066,390, Cl. 8-110.000.

Chromalloy American Corporation: *See—*
Speirs, Kenneth K.; and Bradley, Robert P., 4,066,806, Cl. 427-253.000.

Chrysler Corporation: *See—*
Caron, LaVerne Andrew; Tomczak, Lawrence William; and Crall, Frederick William, 4,066,054, Cl. 123-117.00R.
Graham, Kenneth A., 4,066,721, Cl. 261-62.000.

Chytil, Frank S.: *See—*
Smith, Robert E.; Chytil, Frank S.; Feldstein, George; and Swartz, Dorman J., 4,066,217, Cl. 242-25.00R.

Ciba-Geigy AG: *See—*
Abel, Heinz; and Topfl, Rosemarie, 4,066,392, Cl. 8-127.500.

Ciba-Geigy Corporation: *See—*
Breitenfellner, Franz; Buxbaum, Lothar; and Leidig, Karl, 4,066,607, Cl. 260-40.00R.
Bunge, Hans-Henning, 4,066,595, Cl. 260-29.40R.
Darmory, Franklin P.; and DiBenedetto, Marianne, 4,066,609, Cl. 260-42.180.
Herzog, Hans; Buxbaum, Lothar; Kainmuller, Thomas; and Habermeier, Jurgen, 4,066,626, Cl. 260-75.00N.
Jager, Horst, 4,066,597, Cl. 260-29.6WB.
Kormany, Geza; and Kabas, Guglielmo, 4,066,830, Cl. 542-456.000.
Lind, Hanns, 4,066,616, Cl. 260-45.8NT.
Muller, Albrecht, 4,066,621, Cl. 260-47.0UA.
Nagarajan, Kuppuswamy; Arya, Vishwa Prakash; and George, Thomas, 4,066,778, Cl. 424-273.00R.
Ramanthan, Visvanathan, 4,066,637, Cl. 260-146.00R.
Riat, Henri; and Hegar, Gert, 4,066,389, Cl. 8-41.00R.
Soiron, Charles; and Keller, Karlheinz, 4,066,395, Cl. 8-169.000.
Sury, Yel S.; and Lignos, James M., 4,066,642, Cl. 260-251.00P.
von Bredow, Brigitta; and Pissiotas, Georg, 4,066,437, Cl. 71-91.000.

Cincinnati Electronics Corporation: *See—*
Munninghoff, Clement W., 4,067,050, Cl. 360-40.000.

Cines, Martin R.; and Buchanan, Ben B., to Phillips Petroleum Company. Water purification by treating with activated carbon before biochemical treatment. 4,066,538, Cl. 210-15.000.

Citizen Watch Company Limited: *See—*
Nakajima, Fumio; Machida, Takayasu; and Yamada, Kenji, 4,066,947, Cl. 318-696.000.

Citkowski, Ronald W.: *See—*
Chang, Yew C.; Ovshinsky, Stanford R.; and Citkowski, Ronald W., 4,066,460, Cl. 96-48.00R.

Ciupke, Werner W., to Montron Corporation. Cartridge viewer. 4,066,348, Cl. 352-129.000.

CKD Praha, oborovy podnik: *See—*
Novak, Petr; Pellant, Michal; and Reichel, Pavel, 4,067,042, Cl. 357-82.000.

Clark, Garry E., to General Signal Corporation. Device for preventing traction power harmonic interference on high frequency track circuits. 4,066,229, Cl. 246-34.0CT.

Clark, Ian Sidney Rex; Pargeter, John Kenneth; and Ward, John Oliver, to International Nickel Company, Inc., The. Spray casting of gas atomized molten metal to produce high density ingots. 4,066,117, Cl. 164-46.000.

Clark, Jack D.: *See—*
McBride, La Vaughn R.; Clark, Jack D.; and Center, Dale, 4,066,605, Cl. 260-37.0EP.

Clark, William Randolph, to I-T-E Imperial Corporation. Over-voltage protection. 4,067,054, Cl. 361-91.000.

Clarke, Ellis Whiteside. Means for controlling fluid flow. 4,066,238, Cl. 251-6.000.

Clasen, Hermann, to Hoechst Aktiengesellschaft. Process for the manufacture of organic hydrazines. 4,066,698, Cl. 260-569.000.

Clatworthy, Edward Frederick: *See—*
Smith, Darrell Franklin, Jr.; Clatworthy, Edward Frederick; and Wenschhof, Donald Edward, Jr., 4,066,447, Cl. 75-122.000.

Clean Power Systems, Inc.: *See—*
Hager, Lowell T., 4,066,055, Cl. 123-119.00B.

Clemens, Carl F., to Xerox Corporation. Colored xerographic image transfer process. 4,066,802, Cl. 427-24.000.

Clements, Roy Milton, to Southern Pacific Transportation Company. Apparatus for locating a malfunctioning brake control valve on train. 4,066,299, Cl. 303-20.000.

Cobb, Thomas A. Dolly means. 4,066,272, Cl. 280-79.10R.

Coe, Norman O. Structural combination flange gauge. 4,065,855, Cl. 33-174.00R.

Coggins, Eugene L.: *See—*
Key, Walter W.; and Coggins, Eugene L., 4,066,975, Cl. 330-81.000.

Cohen, Antony. Loading ramp. 4,065,825, Cl. 14-72.500.

Cohen, Emory M.: *See—*
Kelly, Joseph D.; Cohen, Emory M.; Henley, Barry K.; Holt, Hammond H.; and Agalsoff, John, 4,067,049, Cl. 360-14.000.

Cohen, Michael Robert; Kierstead, Richard Wightman; and Tilley, Jefferson Wright, to Hoffmann-La Roche Inc. Thiourea derivatives. 4,066,695, Cl. 260-564.00E.

Coleman, Kenneth L. Drinking and pouring spout for use with easy-opening containers. 4,066,191, Cl. 222-569.000.

Colgate-Palmolive: *See—*
Leonard, Ralph Spencer, 4,066,394, Cl. 8-137.000.

Colgate-Palmolive Company: *See—*
Schaar, Charles H., 4,066,081, Cl. 128-287.000.
Tomlinson, Kenneth; and Harrison, Michael, 4,066,745, Cl. 424-49.000.

Collier, Milton F.: *See—*
Hare, William C.; and Collier, Milton F., 4,066,158, Cl. 193-34.000.

Collin, David Trevor: *See—*
Lunts, Lawrence Henry Charles; and Collin, David Trevor, 4,066,755, Cl. 424-230.000.

Collins, Johnny Will; Kochmanis, Gunars; and Lynch, Bobby Ross, to Owens-Illinois, Inc. Transfer device for nestable container bodies. 4,066,174, Cl. 214-7.000.

Collins Machinery Corporation: *See—*
Elkin, Robert D., 4,066,270, Cl. 279-2.00R.

Colten, Jerrold L., to Bristol Products, Inc. Flexible electric heating cable. 4,066,870, Cl. 219-528.000.

Columberg, Alfred, to Battelle Memorial Institute. Olefin-polymerization catalysts. 4,066,571, Cl. 252-431.00C.

Commissariat a l'Energie Atomique: *See—*
Borel, Joseph; Lacour, Jacques; and Merckel, Gerard, 4,065,847, Cl. 29-578.000.
Bourdois, Claude; Glachet, Charles; Marchal, Paul; and Vertut, Jean, 4,066,909, Cl. 250-497.000.
Dargent, Bruno; and Robert, Jacques, 4,066,333, Cl. 350-160.0LC.

Communications Satellite Corporation: *See—*
Ridings, Robert Paul, Jr.; and Lanier, Raymond Henry, 4,066,844, Cl. 179-15.0BW.

Compagnie Francaise des Petroles: *See—*
Corgnet, Jean Louis, 4,066,031, Cl. 114-294.000.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Houdard, Jean-Pierre, 4,066,881, Cl. 364-726.000.
Lepreux, Guy, 4,065,821, Cl. 9-8.00R.

Compton, James B.; and Ochi, Sam S., to National Semiconductor Corporation. Circuit combining bipolar transistor and JFET's to produce a constant voltage characteristic. 4,066,917, Cl. 307-304.000.

Conch L.N.G.: *See—*
Cuthbert, William Livingstone; and Brown, Thomas, 4,066,184, Cl. 220-9.0LG.

Condrac, Edward J., to Carrier Corporation. Probe holder for a machine body position sensor, with means to increase its natural frequency. 4,066,949, Cl. 324-262.000.

Congoleum Corporation: *See*—
Winters, Donald C.; Haemer, Laurence F.; and Powell, William H., 4,066,813, Cl. 426-282.000.

Conley, Fred Miller, to Gardner-Denver Company. Heavy duty industrial scale. 4,066,140, Cl. 177-134.000.

Connick, Francis G.; and Bernholdt, Harry F., to Swift & Company. Canned meat products of improved tenderness. 4,066,790, Cl. 426-8.000.

Connor, David T.; Young, Patricia A.; and von Strandtmann, Max, to Warner-Lambert Company. 4,10-Dihydro-4,10-dioxo-1H-l-benzopyrano[3,2-b]pyridine-3-carboxylic acids, salts and esters. 4,066,655, Cl. 260-295.50T.

Considine, Brian: *See*—
Taylor, Peter; and Considine, Brian, 4,065,904, Cl. 52-731.000.

Constant, James Nickolas. Beam focused synthetic aperture. 4,067,009, Cl. 343-5.0CM.

Continental Oil Company: *See*—
Davis, J. Gilbert, II, 4,065,927, Cl. 61-36.00R.
Holliday, Leland Robert; and Poe, Ronald Laurence, 4,066,682, Cl. 260-462.00R.

Contraves-Goerz Corporation: *See*—
McNally, Paul F., 4,066,973, Cl. 330-10.000.

Control Data Corporation: *See*—
Zenk, George Edward, 4,066,852, Cl. 200-5.00A.
Zenk, George Edward, 4,066,853, Cl. 200-5.00A.
Zenk, George Edward; and Ditzik, Richard Joseph, 4,066,854, Cl. 200-5.00A.
Zenk, George Edward, 4,066,855, Cl. 200-5.00A.

Conway, Terry T.: *See*—
Belleau, Bernard R.; Doyle, Terrence W.; Luh, Bing Yu; and Conway, Terry T., 4,066,831, Cl. 544-105.000.
Menard, Marcel; Lim, Gary M. F.; and Conway, Terry T., 4,066,832, Cl. 544-105.000.

Cook, Nathan Henry; and Kramer, Bruce M., to Massachusetts Institute of Technology. Tungsten carbide tools treated with group IVB and VB metals. 4,066,821, Cl. 428-539.000.

Coone, Joseph H., Jr.: *See*—
Suggitt, Robert M.; Coone, Joseph H., Jr.; and Gates, Walter C., Jr., 4,066,699, Cl. 260-583.00R.

Corbin, Edgar A., Jr., to Diamond Shamrock Corporation. Cheese manufacture with acidified powdered milk. 4,066,791, Cl. 426-39.000.

Cordis Corporation: *See*—
Hess, Stanley R., 4,066,085, Cl. 128-418.000.

Corgnet, Jean Louis, to Compagnie Francaise des Petroles. Device for regulation of anchorage forces. 4,066,031, Cl. 114-294.000.

Cornelius, Dennis Alfred; Eberts, Nancy Jane; and Sternberg, Moshe M., to Miles Laboratories, Inc. Sodium chloride flavor substitute composition and use thereof. 4,066,799, Cl. 426-534.000.

Corrado, Pasquale A.: *See*—
Olson, Larry Lee; and Jones, Richard Henry, 4,066,548, Cl. 210-160.000.

Cossutta, Giuseppe; and Cellai, Marino, to SGS-ATES Componenti Elettronici S.p.A. Molded body incorporating heat dissipator. 4,066,839, Cl. 174-52.0PE.

Costanza, Samuel T.; Franklin, Peter G.; Gebhardt, Frank L.; Israel, Jack D.; Moore, Charles R.; and Wheatley, Charles E., III, to Rockwell International Corporation. Communication system. 4,066,964, Cl. 325-55.000.

Cottage, Robert L.: *See*—
Myers, George D.; Walters, Paul W.; and Cottage, Robert L., 4,066,533, Cl. 208-153.000.

Courtney, John E.; Urso, Charles J.; and Dir, Gary A., to Xerox Corporation. Variable density lens. 4,066,335, Cl. 350-160.0LC.

Cowan, Glyndal D.: *See*—
Drake, Charles A.; and Cowan, Glyndal D., 4,066,417, Cl. 23-289.000.

Cox, Duncan B., Jr.; and Lee, William H., to Charles Stark Draper Laboratory, Inc., The. Digital phase-locked loop filter. 4,066,978, Cl. 331-1.00A.

Cox, James P.; and Beach, Robert W. Buoyant solid cover for ponds and method of making the same. 4,066,400, Cl. 21-60.50R.

Cragoe, Edward J., Jr.; Bicking, John B.; and Smith, Robert L., to Merck & Co., Inc. 9-Thia- and oxothia- and 9-dioxothia-11,12-seco-prostaglandins and processes. 4,066,675, Cl. 260-400.000.

Cragoe, Edward J., Jr.; Bicking, John B.; and Smith, Robert L., to Merck & Co., Inc. 11,12-Secoprostaglandins. 4,066,692, Cl. 424-312.000.

Craig, Alexander Robertson, to Hilti Aktiengesellschaft. Marking metal. 4,066,807, Cl. 427-282.000.

Crall, Frederick William: *See*—
Caron, LaVerne Andrew; Tomczak, Lawrence William; and Crall, Frederick William, 4,066,054, Cl. 123-117.00R.

Cretella, Salvatore J.; Bernardo, Matthew; and DeMusis, Ralph T. Turbine vane air-foil surface grinder. 4,065,879, Cl. 51-145.00R.

Crew, Robert T., to C & E Enterprises, Inc. Engine actuated instrumentation and a fuel saving and diagnostic system based thereon. 4,065,961, Cl. 73-117.300.

Crooij, Pierre; and Simonet, Guy, to Recherche et Industrie Therapeutiques. Intermediates for preparing α-carboxy-α-(3-thienyl)penicillin and cephalosporin derivatives. 4,066,664, Cl. 260-332.20H.

Crounse, Nathan N.; and Ambrosiano, Nicholas A., to Sterling Drug Inc. 1-Imino-3-(4-imino-5-thiazolidinylidene)isoindolines. 4,066,653, Cl. 260-293.610.

Csutor, Endre, to Brown, Boveri & Cie, A.G. Electric circuit breaker. 4,066,990, Cl. 335-174.000.

Cumberland Corporation: *See*—
Hare, William C.; and Collier, Milton F., 4,066,158, Cl. 193-34.000.

Cummins, Betty L. Comfort cushion for infants. 4,066,072, Cl. 128-40.000.

Cunningham, Richard D., to Northern Natural Gas Company. Portable machine for testing protective coatings. 4,065,964, Cl. 73-150.00A.

Currier, James W., to International Minerals and Chemical Corporation. Process of stabilizing the operation of blast furnaces for producing molten iron. 4,066,443, Cl. 75-41.000.

Curry, Kenneth Vasey: *See*—
Callingham, Martin; and Curry, Kenneth Vasey, 4,066,746, Cl. 424-62.000.

Curtiss-Wright Corporation: *See*—
Jones, Charles; and Loyd, Robert William, Jr., 4,066,044, Cl. 123-8.090.

Cuthbert, William Livingstone; and Brown, Thomas, to Conch L.N.G. Thermal insulation systems. 4,066,184, Cl. 220-9.0LG.

Cynober, Simon A.: *See*—
Virnot, Alain D.; and Cynober, Simon A., 4,066,877, Cl. 364-426.000.

Czajka, Thomas S.; and Needham, Richard P., to Standard Oil Company (Indiana). Water soluble wire enamels. 4,066,593, Cl. 260-29.20E.

Daimler-Benz Aktiengesellschaft: *See*—
Haberle, Fritz; Riechers, Daniel; and Hochrathner, Alfred, 4,066,286, Cl. 293-87.000.

Dainichiseika Color & Chemicals Mfg. Co., Ltd.: *See*—
Horiguchi, Shojiro; Nakamura, Michiei; and Sugito, Yoshifumi, 4,066,462, Cl. 106-14.000.

Dajani, Esam Z.: *See*—
Adelstein, Gilbert W.; Dajani, Esam Z.; and Yen, Chung Hwai, 4,066,654, Cl. 260-293.690.

D'Altroy, Frederick A.; Harrington, Daniel J.; and Miller, Gerald W., to Western Electric Company, Inc. Gate-controlled bidirectional switching device. 4,066,483, Cl. 148-187.000.

Daman, Ernest L., to Foster Wheeler Energy Corporation. Process for producing a fuel gas and sulfur from a hydrocarbon fuel. 4,066,738, Cl. 423-569.000.

Danfoss A/S: *See*—
Baatrup, Johannes Vagn; and Christensen, Thorkild, 4,065,921, Cl. 60-385.000.
Tandrup, Niels, 4,066,102, Cl. 137-625.640.
Tandrup, Niels, 4,066,103, Cl. 137-625.640.

Danguillier, Wilhelm; and Grams, Wolfgang, to Dr. C. Otto & Comp. G.m.b.H. Process for the gasification of solid fuels. 4,066,420, Cl. 48-197.00R.

Dargent, Bruno; and Robert, Jacques, to Commissariat a l'Energie Atomique. Method of control of a liquid-crystal display cell. 4,066,333, Cl. 350-160.0LC.

Darmory, Franklin P.; and DiBenedetto, Marianne, to Ciba-Geigy Corporation. Crosslinked resins prepared from an N,N'-bis-imide and a Schiff base. 4,066,609, Cl. 260-42.180.

Dart Industries, Inc.: *See*—
Kiss, Kornel Dezso; Allan, John Leslie Hugh; and Fein, Marvin Michael, 4,066,610, Cl. 260-42.210.

Darwood, James R., to T.A.D. Telephone ring detector circuit. 4,066,848, Cl. 179-84.00R.

Dassler, Joachim; Veneklasen, Lee H.; and Zschimmer, Martin, to Siemens Aktiengesellschaft. Particle beam apparatus with zones of different pressure. 4,066,905, Cl. 250-396.00R.

Daussin, Bernard: *See*—
Hennemann, Jean; and Daussin, Bernard, 4,066,922, Cl. 310-80.000.

Dave, Bhalchandra Anantray, to Pennwalt Corporation. Fresh mushroom treatment. 4,066,795, Cl. 426-259.000.

David Brown Gear Industries Limited: *See*—
Whateley, Eric Albert; and Pengilly, Eric Alexander, 4,065,981, Cl. 74-410.000.

Davies, David Huw: *See*—
Mallams, Alan K.; and Davies, David Huw, 4,066,752, Cl. 424-180.000.

Davies, David Peter, to McGraw-Edison Company. Method for electrically and hydraulically connecting a water-cooled conductor. 4,066,203, Cl. 228-180.00R.

Davis, Donald L., to Warner Electric Brake & Clutch Company. Breakaway protection for electrically controlled trailer brakes. 4,066,996, Cl. 340-52.00R.

Davis, George B., Jr. Coat hanger shoulder support attachment. 4,066,193, Cl. 223-88.000.

Davis, J. Gilbert, II, to Continental Oil Company. Method for blocking gas flow in a coal seam. 4,065,927, Cl. 61-36.00R.

Davis, Jerry B.; and Gant, Guy W., to Otis Engineering Corporation. Well flow control apparatus and method. 4,066,128, Cl. 166-315.000.

Davis, William A.: *See*—
Garcowski, Ronald J.; and Davis, William A., 4,066,017, Cl. 101-425.000.

Dawson, John Myrick, to TRW Inc. Isotope separation by ion waves. 4,066,893, Cl. 250-282.000.

Day, Ralph K. Replaceable double glazed window defogging appliance and window structure therefor. 4,065,894, Cl. 52-171.000.

Dazey Products Company: *See*—
McNair, Samuel L., 4,066,797, Cl. 426-307.000.

De Staat der Nederlanden, to Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie: *See*—
Spanjersberg, Arie Adriaan, 4,066,999, Cl. 340-146.30S.

Dearlove, William E.: *See—*
King, Ralph J.; Belke, William H.; and Dearlove, William E., 4,066,723, Cl. 264-34.000.
De Bonis, John C. Porsche automobile oil drain replacement tube. 4,066,281, Cl. 285-31.000.
Debras, Maurice: *See—*
Saleil, Jean; Debras, Maurice; and Malefant, Jean-Yves, 4,066,442, Cl. 75-12.000.
Deere & Company: *See—*
Anderkay, Glenn Allan, 4,066,058, Cl. 123-198.00E.
Rehn, Gary Allen, 4,066,132, Cl. 172-572.000.
Stampe, Richard Herbert, 4,066,213, Cl. 239-533.300.
Wittren, Richard Arthur, 4,066,099, Cl. 137-625.660.
DeFeo, Richard J.: *See—*
Long, Robert B.; Caruso, Fred A.; DeFeo, Richard J.; and Walker, David G., 4,066,679, Cl. 260-438.100.
de Fries, Jan Richard. Multiple way valve. 4,066,101, Cl. 137-625.600.
De Haeck, Robert Jean, to La Soudure Electrique Autogene, Procedes Arcos, S.A. Basic agglomerated flux with a high CaO content for the welding of ordinary or low alloy steels. 4,066,478, Cl. 148-26.000.
Dela Ruye, Jacques: *See—*
Olink, Jan; and Dela Ruye, Jacques, 4,066,815, Cl. 428-336.000.
Dellorfano, Fred M., Jr.: *See—*
Massa, Frank, 4,066,095, Cl. 137-486.000.
DEMATEX Development & Investment Establishment: *See—*
Micheli, Antoine, 4,066,067, Cl. 128-2.00F.
de Mathan, Olivier: *See—*
Gastineau, Charles; de Mathan, Olivier; and Dilly, Jan-Dominique, 4,066,633, Cl. 260-112.00R.
Demerson, Christopher A.; Humber, Leslie G.; Santroch, George; Dobson, Thomas A.; and Jirkovsky, Ivo, to Ayerst McKenna and Harrison Ltd. Thiazinoindoles useful as antidepressants. 4,066,763, Cl. 424-246.000.
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., to Ayerst, McKenna and Harrison Ltd. Pyranoindole derivatives, compositions and method of use. 4,066,779, Cl. 424-274.000.
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., to Ayerst McKenna and Harrison Ltd. Pyranoindole derivatives as antiulcer agents. 4,066,780, Cl. 424-274.000.
DeMusis, Ralph T.: *See—*
Cretella, Salvatore J.; Bernardo, Matthew; and DeMusis, Ralph T., 4,065,879, Cl. 51-145.00R.
Denning, David B.: *See—*
Allen, Thomas C.; and Denning, David B., 4,066,584, Cl. 260-17.4CL.
Denning, Richard: *See—*
Rosnowski, Wojciech; and Denning, Richard, 4,066,485, Cl. 148-188.000.
Denny, George H., to Merck & Co., Inc. Process for the preparation of substituted trichloroacetamidine derivatives. 4,066,661, Cl. 260-326.150.
Denver Fire Reporter & Protective Co., Inc.: *See—*
Sprowls, Joseph B., III, 4,067,008, Cl. 340-409.000.
Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Pyrazolo[1,5-a]pyrido[3,2-e]pyrimidine-7-carboxylic acid derivatives. 4,066,643, Cl. 260-256.40F.
Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Pyrazolo [1,5-a]pyrido[3,2-e]pyrimidine-7-carboxylic acid heterocyclic derivatives. 4,066,644, Cl. 260-256.40F.
Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Derivatives of pyrazolo [1,5-a]pyrido[3,4-e]pyrimidine. 4,066,645, Cl. 260-256.40F.
Derchak, Nicholas, to Sperry Rand Corporation. Shared direct memory access controller. 4,067,059, Cl. 364-200.000.
De Rossi, Frank, to Dexter Corporation, The. Release coating for aluminum and tinplate steel cookware. 4,066,817, Cl. 428-339.000.
Dertouzos, Michael L.; and Graham, Huber L., to Dertouzos, Michael L. Parallel thermal printer. 4,067,017, Cl. 346-46.000.
Dery, Normand. Method of applying and repairing rear window defroster. 4,065,848, Cl. 29-611.000.
Determann, Helmut: *See—*
Rauscher, Elli; Bernt, Erich; Gruber, Wolfgang; and Determann, Helmut, 4,066,508, Cl. 195-99.000.
Deuber, John M.: *See—*
Stevens, Peter; and Deuber, John M., 4,066,517, Cl. 204-43.00N.
Devlin, Thomas A., to Aspro, Inc. Digital traction control system. 4,066,300, Cl. 303-96.000.
Dexter Corporation, The: *See—*
De Rossi, Frank, 4,066,817, Cl. 428-339.000.
deZabala, Edward Francis: *See—*
Adams, Jim Mills; and deZabala, Edward Francis, 4,066,173, Cl. 214-1.00C.
Dezawa, Shin-Ichiro: *See—*
Sasazawa, Koji; Dezawa, Shin-Ichiro; and Kitamoto, Tatsuji, 4,066,564, Cl. 252-62.560.
Sasazawa, Koji; Dezawa, Shin-Ichiro; and Kitamoto, Tatsuji, 4,066,565, Cl. 252-62.560.
Diamand, Felix; Bourrabier, Guy; and Antoine, Robert, to Thomson-CSF. Negative resistance microwave circuit comprising one or more pairs of diodes. 4,066,979, Cl. 331-56.000.
Diamond Shamrock Corporation: *See—*
Corbin, Edgar A., Jr., 4,066,791, Cl. 426-39.000.
Hawk, Roger M.; and Mitchell, Thomas A., 4,066,948, Cl. 324-30.00R.
DiBenedetto, Marianne: *See—*
Darmory, Franklin P.; and DiBenedetto, Marianne, 4,066,609, Cl. 260-42.180.
Dickler, Paul J. Locking mechanism for tamper-proof backpack or piece of luggage. 4,066,195, Cl. 224-8.00R.
Dickopp, Gerhard; and Schroder, Ernst, to Licentia Patent-Verwaltungs-G.m.b.H. Amplifier with variable gain. 4,066,976, Cl. 330-86.000.
Dicksa, James K.: *See—*
Emmett, Robert C., Jr.; Dicksa, James K.; Wojcik, Bruce C.; and Baczek, Frank A., 4,066,520, Cl. 204-108.000.
Dickson, Arthur D., to Minnesota Mining and Manufacturing Company. Electroluminescent lamp and electrode preform for use therewith. 4,066,925, Cl. 313-503.000.
Diebold, Robert J. A jet pump. 4,066,385, Cl. 417-172.000.
Diehl, Robert Eugene: *See—*
Lutz, Albert William; and Diehl, Robert Eugene, 4,066,441, Cl. 71-121.000.
Diepeveen, John C. Die placement tool or the like. 4,066,200, Cl. 228-3.100.
DiFerdinando, Frank L., to Westinghouse Electric Corporation. Turbine rotor blade having integral tenon thereon and split shroud ring associated therewith. 4,066,384, Cl. 416-189.000.
Dilly, Jan-Dominique: *See—*
Gastineau, Charles; de Mathan, Olivier; and Dilly, Jan-Dominique, 4,066,633, Cl. 260-112.00R.
Dimmig, Daniel Ashton, to Pennwalt Corporation. Process for preparation of linear polyamide-imides from aromatic tricarboxylic acid anhydrides and diamines. 4,066,631, Cl. 260-78.00R.
Dinwiddie, Kendall L. Low impedance, high current pressure transducer. 4,065,969, Cl. 73-727.000.
Dir, Gary A.: *See—*
Courtney, John E.; Urso, Charles J.; and Dir, Gary A., 4,066,335, Cl. 350-160.0LC.
Dittmar, Bruce Ivor, to Du Pont de Nemours, E. I., and Company. Method for protecting loci against fungi and mites. 4,066,777, Cl. 424-273.00R.
Ditzik, Richard Joseph: *See—*
Zenk, George Edward; and Ditzik, Richard Joseph, 4,066,854, Cl. 200-5.00A.
Dixon, Dale D.; Ford, Michael E.; and Mantell, Gerald J., to Air Products and Chemicals, Inc. End capped polyalkylene carbonates having improved thermal stability. 4,066,630, Cl. 260-77.50D.
Dobson, Thomas A.: *See—*
Demerson, Christopher A.; Humber, Leslie G.; Santroch, George; Dobson, Thomas A.; and Jirkovsky, Ivo, 4,066,763, Cl. 424-246.000.
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,066,779, Cl. 424-274.000.
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,066,780, Cl. 424-274.000.
Dr. C. Otto & Comp. G.m.b.H.: *See—*
Danguillier, Wilhelm; and Grams, Wolfgang, 4,066,420, Cl. 48-197.00R.
Dokoupil, Jiri; Zapfel, Horst; Gabelmann, Erich; and Breitwieser, Helmut, to Badische Maschinenfabrik GmbH. Rotary ironing machine. 4,065,943, Cl. 69-41.000.
Dolby Laboratories, Inc.: *See—*
Gundry, Kenneth James, 4,066,914, Cl. 307-237.000.
Dolch, Volker. Heart rate change sensor. 4,066,069, Cl. 128-2.06F.
Dollar, David L.: *See—*
Scholes, Addison B.; Dollar, David L.; and Hurst, Robert L., 4,066,803, Cl. 427-26.000.
Dooley, Eddie W.: *See—*
Morey, Everett D.; and Dooley, Eddie W., 4,066,393, Cl. 8-137.000.
Doran, Samuel K.; and Perkins, Merlyn H., to International Business Machines Corporation. Method and system for automatically correcting aberrations of a beam of charged particles. 4,066,863, Cl. 219-121.0EM.
Dorman, Linneaus C.; and Steiner, Edwin C., to Dow Chemical Company, The. Preparation of peptides. 4,066,684, Cl. 260-112.50R.
Dorr, Wolfgang; and Matzner, Hartwig, to Mannesmann Aktiengesellschaft. Supervision and control of continuous casting. 4,066,114, Cl. 164-4.000.
Dotzer, Richard: *See—*
Stoger, Klaus; Dotzer, Richard; and Gehring, Johann, 4,066,515, Cl. 204-14.00N.
Dougherty, Joseph J.: *See—*
McGregor, William H.; and Dougherty, Joseph J., 4,066,634, Cl. 260-112.50S.
Doughty, Joseph B.; and Klem, Robert E., to Westvaco Corporation. Process for making quaternary amines of epichlorohydrin. 4,066,673, Cl. 260-348.130.
Dow Chemical Company, The: *See—*
Dorman, Linneaus C.; and Steiner, Edwin C., 4,066,684, Cl. 260-112.50R.
Johnston, Howard; and Senkbeil, Herman O., 4,066,438, Cl. 71-94.000.
Kamp, Arthur J.; and Mischler, Philip G., 4,066,898, Cl. 250-359.000.
Strycker, Stanley J., 4,066,771, Cl. 424-267.000.
Dow Corning Corporation: *See—*
Homan, Gary R.; and Lee, Chi-Long, 4,066,603, Cl. 260-37.0SB.

Dow, Norris F.: *See—*
Halton, Murray; Dow, Norris F.; Dow, Richard M.; and Hillebrand, Michael J., 4,066,104, Cl. 139-11.000.

Dow, Richard M.: *See—*
Halton, Murray; Dow, Norris F.; Dow, Richard M.; and Hillebrand, Michael J., 4,066,104, Cl. 139-11.000.

Doyle, Terrence W.: *See—*
Belleau, Bernard R.; Doyle, Terrence W.; Luh, Bing Yu; and Conway, Terry T., 4,066,831, Cl. 544-105.000.

Drake, Charles A.; and Cowan, Glyndal D., to Phillips Petroleum Company. Solid-fluid contacting apparatus. 4,066,417, Cl. 23-289.000.

Drawert, Manfred: *See—*
Schepp, Horst; and Drawert, Manfred, 4,066,585, Cl. 260-18.00N.

Dreke, Werner: *See—*
Junge, Peter; Schulz, Horst; Schneider, Rainer; Dreke, Werner; and Rieger, Gerhard, 4,066,818, Cl. 428-341.000.

Drennan, John J.: *See—*
Hanna, Ward T.; Drennan, John J.; and Staroska, John T., 4,066,167, Cl. 206-627.000.

Dresser Industries, Inc.: *See—*
Read, Norman Weldon, 4,066,241, Cl. 251-361.000.

D'Silva, Themistocles D. J., to Union Carbide Corporation. Ketoalkanesulfenylcarbamoyl and ketoalkanethiosulfenylcarbamoyl halides. 4,066,689, Cl. 260-544.00C.

Dubeck, Michael; and Knapp, Gordon G., to Ethyl Corporation. Metal extraction from sea nodules. 4,066,733, Cl. 423-32.000.

Dudek, Edmund C.: *See—*
Bardwell, Francis G.; and Dudek, Edmund C., 4,066,942, Cl. 318-434.000.

Dudley, Michael A.; Parthasarathy, Mellapalayam R.; and Nerthersole, Douglas C., to Canada Wire and Cable Limited. Continuous powder feed system for maintaining a uniform powder coating thickness on objects being coated by electrostatic fluidized beds. 4,066,040, Cl. 118-629.000.

Dudley, William F., Jr.: *See—*
Leaver, Brian E.; and Dudley, William F., Jr., 4,066,879, Cl. 364-498.000.

Dulger, Viktor; and Ernst, Franz. Apparatus to regulate the pH value or other similar values of a solution. 4,066,092, Cl. 137-93.000.

Dunivan, Neal Duane: *See—*
Hall, Daniel L.; and Dunivan, Neal Duane, 4,066,285, Cl. 293-62.000.

Dunn, George Lawrence, to SmithKline Corporation. Derivatives of 7-(2-substituted-2-hydroxyiminoacetamido)-3-(1-substituted tetrazol-5-ylthiomethyl-3-cephem-4-carboxylic acid. 4,066,762, Cl. 424-246.000.

Du Pont de Nemours, E. I., and Company: *See—*
Carter, Elbert P., 4,066,362, Cl. 356-180.000.
Dittmar, Bruce Ivor, 4,066,777, Cl. 424-273.00R.
Johnson, Donald R.; Nadeau, Richard G.; Nieuweboer, Gerrit; and Truett, William L., 4,066,412, Cl. 23-253.00R.
Jungpeter, Raymond R.; and Buchholz, Jean L., 4,065,838, Cl. 26-94.000.
Kilgren, Arnold William; Low, David Nicholson; and Porter, Robert Warwick, 4,066,424, Cl. 55-71.000.
Kleinschuster, Jacob John; and Pletcher, Terry Carl, 4,066,620, Cl. 260-47.00C.
Lovendusky, Charles Michael, 4,066,326, Cl. 339-221.00M.
McIntosh, Colin Leslie, 4,066,434, Cl. 71-86.000.
Vladuchick, Susan Anne, 4,066,656, Cl. 260-302.00F.

D'Urso, Giuseppe. Grinding tool fitted with an abrasive sheet having active face and edge surfaces. 4,065,882, Cl. 51-381.000.

Dyer, Richard S.: *See—*
Wiegert, Gerald A.; and Negele, James R., 4,066,290, Cl. 296-78.100.

Dynek Corporation: *See—*
Stern, Emanuel, 4,066,551, Cl. 210-282.000.

Dysarz, Edward David, to James G. Brown & Associates, Inc. Rig transport method. 4,065,934, Cl. 61-87.000.

Dziedzic, Edward: *See—*
Mastalski, Henry N.; Lucas, James P.; Dziedzic, Edward; and Eppinger, David P., 4,066,368, Cl. 403-211.000.

E. R. Squibb & Sons, Inc.: *See—*
Denzel, Theodor; and Hoehn, Hans, 4,066,643, Cl. 260-256.40F.
Denzel, Theodor; and Hoehn, Hans, 4,066,644, Cl. 260-256.40F.
Denzel, Theodor; and Hoehn, Hans, 4,066,645, Cl. 260-256.40F.

E-Systems, Inc.: *See—*
Chambers, Ramon P.; Sanders, David E.; and Gordy, Robert S., 4,066,977, Cl. 330-129.000.

Earnest, Ernest R., to Hydragon Corporation. Turbine stator nozzles. 4,066,381, Cl. 415-202.000.

Eastman, James M., to Bendix Corporation, The. Fluid pressure operated rotary stepper actuator. 4,066,002, Cl. 91-36.000.

Eastman Kodak Company: *See—*
Bloom, Melvin S.; and Fico, Sally S., 4,066,676, Cl. 260-402.500.
Bruschi, Barbara J., 4,066,403, Cl. 23-230.00B.
Mey, William; and Bailey, David S., 4,066,455, Cl. 96-1.50R.
Pearce, Phillip W.; and Hutchison, Robert J., 4,066,969, Cl. 328-5.000.
Schubert, Alvin Louis, 4,066,341, Cl. 350-285.000.

Easton, Harlan J. Feeding mechanism for granular material. 4,066,164, Cl. 198-616.000.

Eberle, William J., to General Battery Corporation. System and method for protecting the environment in a battery production room. 4,066,825, Cl. 429-71.000.

Eberts, Nancy Jane: *See—*
Cornelius, Dennis Alfred; Eberts, Nancy Jane; and Sternberg, Moshe M., 4,066,799, Cl. 426-534.000.

Ebner, Peter R., to Itek Corporation. Inexpensive and reliable custom programmable phototypesetter. 4,067,022, Cl. 354-7.000.

Echo Co., Ltd.: *See—*
Nakajima, Kiminori; and Shigenobu, Ikuo, 4,066,090, Cl. 137-62.000.

Eckle, Otto; and Stahl, Hermann, to Komet Stahlhalter- und Werkzeugfabrik, Robert Breuning GmbH. Turning tool with interchangeable polygonal cutting insert. 4,066,376, Cl. 407-101.000.

Edelman, Robert, to Celanese Corporation. Process for preparing carbodiimides utilizing a phosphonium salt catalyst. 4,066,629, Cl. 260-77.50R.

Eder, Ulrich; Sauer, Gerhard; Haffer, Gregor; Neef, Guenter; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Process for the preparation of 1,3-oxygenated 8α-estratrienes and novel intermediates obtained therefrom. 4,066,674, Cl. 260-397.500.

Edhlund, Ronald D., to American Photo-Graphics Corporation. Method and apparatus for preparing film for exposure with a film font. 4,065,990, Cl. 83-133.000.

Edwards, Roger Alan: *See—*
Baylis, Howard Raymond; Edwards, Roger Alan; and Hedgeland, David Richard Sweatman, 4,067,021, Cl. 346-76.00L.

Effland, Richard C., to American Hoechst Corporation. Method of preparation of 3-(3-carboxy-4-hydroxyphenyl)-4,5-dihydro-2-phenylbenz (e) indole and valuable intermediates related thereto. 4,066,659, Cl. 260-326.13F.

Egerstrom, Bengt Gunnar Wilhelm, to Nitro Nobel AB. Hose feeding winch. 4,066,093, Cl. 137-355.200.

Eggert, Frank, to Schlegel GmbH. Profile strip for framing and fastening secondary glazing panes. 4,065,900, Cl. 52-476.000.

Eguchi, Hajime, to Ajinomoto Co., Inc. Seasoning composition and preparation thereof. 4,066,793, Cl. 426-60.000.

Eguizabal, Julian, to Pioneer Products, Inc. Muzzle loading firearm. 4,065,866, Cl. 42-51.000.

Egyud, Laszlo G. Keto-aldehyde-amine addition products and method of making same. 4,066,650, Cl. 260-281.00G.

Eiselt, Gunter, to Recticel Deutschland Kunststoffe GmbH. Method of and device for packaging blocks of foamed synthetic material. 4,065,910, Cl. 53-24.000.

Eisentraut, Anna M., to Nuclear-Medical Laboratories, Inc. Thyroid hormone assay. 4,066,410, Cl. 23-230.600.

Ek, Jan Olof: *See—*
Lundbald, Leif Jorgen I.; and Ek, Jan Olof, 4,066,253, Cl. 271-4.000.

Ekenstam, Bo Thuresson Af: *See—*
Branemark, Per Ingvar; and Ekenstam, Bo Thuresson Af, 4,065,817, Cl. 3-1.910.

Eknayan, Hrant. Pollution minimizing device and method for internal combustion engines. 4,065,919, Cl. 60-274.000.

Eksell, Lennart: *See—*
Hjelte, Sven Roland; and Eksell, Lennart, 4,066,222, Cl. 242-107.40B.

Elco Corporation: *See—*
Baker, Charles E.; and Silverzweig, Abraham, 4,066,319, Cl. 339-97.00R.

Elder, J. Calvin, to Westinghouse Air Brake Company. Route control system for railroad interlockings. 4,066,228, Cl. 246-5.000.

Eldred, Roger J.; Iobst, Stanley A.; and Abu-Isa, Ismat A., to General Motors Corporation. Ethylene-propylene elastomers and ethylene-propylene-diene elastomers with improved heat and oil resistance. 4,066,590, Cl. 260-28.50A.

Electricity Council, The: *See—*
Jones, Ivor Wynn; Robinson, Graham; and Bird, Thomas Lewis, 4,066,826, Cl. 429-104.000.

Electrides Corporation: *See—*
Summa, Frank A., 4,066,930, Cl. 315-209.00R.

Electroglas, Inc.: *See—*
Roch, Jacques L., 4,066,943, Cl. 318-468.000.

Eli Lilly and Company: *See—*
Jones, Reuben G.; and Terando, Norman H., 4,066,776, Cl. 424-270.000.

ELITEX, Zavody textilniho strojirenstvi generalni reditelstvi: *See—*
Kejnovsky, Bohumil; and Kopecny, Miroslav, 4,065,942, Cl. 66-177.000.

Elkin, Robert D., to Collins Machinery Corporation. Nipple chuck. 4,066,270, Cl. 279-2.00R.

Ellis Industries, Inc.: *See—*
Ellis, Lawrence D.; and Evans, Robert E., 4,065,824, Cl. 14-71.300.

Ellis, Lawrence D.; and Evans, Robert E., to Ellis Industries, Inc. Lip extender for loading dock levelers. 4,065,824, Cl. 14-71.300.

Elola, Alfonso M. Brake shoe rivet removal press. 4,065,843, Cl. 29-252.000.

Elsey, Paul G.: *See—*
Wollensak, John C.; Ihrman, Kryn G.; and Elsey, Paul G., 4,066,562, Cl. 252-52.00R.

Elvin, Sten, to ASEA Aktiebolaget. Means for controlling the speed of a cable. 4,066,141, Cl. 180-2.00R.

Emerson, Reginald Stanley, to Leslie Hartridge Limited. Apparatus for measuring smoke density. 4,066,364, Cl. 356-207.000.

Emery Industries, Inc.: *See—*
Mains, Harold E.; Williams, Frederick R.; and O'Brien, William L., 4,066,587, Cl. 260-22.00D.
Mores, Lee R.; McCarthy, Justin P.; and Slack, James J., 4,066,789, Cl. 424-365.000.

EMI Limited: *See—*
Hounsfield, Godfrey Newbold; and Langstone, Peter George, 4,066,906, Cl. 250-445.00T.
LeMay, Christopher Archibald Gordon, 4,066,900, Cl. 250-360.000.
LeMay, Christopher Archibald Gordon, 4,066,902, Cl. 250-363.00S.
LeMay, Christopher Archibald Gordon, 4,066,903, Cl. 250-363.00S.

Emmett, Robert C., Jr.; Dicksa, James K.; Wojcik, Bruce C.; and Baczek, Frank A., to Envirotech Corporation. Slurry electrowinning process. 4,066,520, Cl. 204-108.000.

Energy Conversion Devices, Inc.: *See—*
Chang, Yew C.; Ovshinsky, Stanford R.; and Citkowski, Ronald W., 4,066,460, Cl. 96-48.00R.

Engelhard Minerals & Chemicals Corporation: *See—*
Pfefferle, William C., 4,065,917, Cl. 60-39.82C.

Engelsmann, Dieter: *See—*
Vesper, Rainer; and Engelsmann, Dieter, 4,067,029, Cl. 354-137.000.

Engineered Systems, Inc.: *See—*
Salley, Ernest J., 4,066,880, Cl. 235-302.300.

Ennis, Daniel Martin. Synthetic N-releasing soil conditioner. 4,066,431, Cl. 71-27.000.

Enomoto, Shigeo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Device for limiting the extent of movement of a moveable member in a motor operated focussing device in a camera. 4,067,031, Cl. 354-195.000.

Ensor, John E. Smoke reducer for cigarette smokers. 4,066,088, Cl. 131-185.000.

Envirotech Corporation: *See—*
Emmett, Robert C., Jr.; Dicksa, James K.; Wojcik, Bruce C.; and Baczek, Frank A., 4,066,520, Cl. 204-108.000.

Epes, Archie C. Composite foundation framing assembly. 4,065,893, Cl. 52-169.110.

Eppinger, David P.: *See—*
Mastalski, Henry N.; Lucas, James P.; Dziedzic, Edward; and Eppinger, David P., 4,066,368, Cl. 403-211.000.

Equipto Electronics Corporation: *See—*
Gazarek, Kenneth F., 4,066,305, Cl. 312-195.000.

Erich Grau Stanzwerk fur Elektrobleche: *See—*
Gotz, Martin, 4,065,954, Cl. 72-456.000.

Erickson, Henry, to Atlantic Richfield Company. Method for producing alumina. 4,066,740, Cl. 423-628.000.

Ernst, Franz: *See—*
Dulger, Viktor; and Ernst, Franz, 4,066,092, Cl. 137-93.000.

Ernst, Nikolaus: *See—*
Wirbser, Oskar; and Ernst, Nikolaus, 4,066,204, Cl. 228-264.000.

Escher Wyss Limited: *See—*
Guyer, August, 4,066,554, Cl. 210-342.000.

Esposito, Charles M., to Grumman Aerospace Corporation. Digital stimulus generating and response measuring means. 4,066,882, Cl. 235-302.000.

Essex Group, Inc.: *See—*
Furtah, Reginald D., 4,066,369, Cl. 403-115.000.

Estes, John H.: *See—*
Herbstman, Sheldon; Webb, Allen N.; and Estes, John H., 4,066,716, Cl. 260-683.470.

Ethyl Corporation: *See—*
Dubeck, Michael; and Knapp, Gordon G., 4,066,733, Cl. 423-32.000.
Johnston, James D.; Sanders, Robert N.; and Wood, James M., Jr., 4,066,445, Cl. 75-67.00R.
Lawrence, Walter W., Jr.; McKay, Tom W.; and Wiegand, Karl E., 4,066,688, Cl. 260-535.00P.
Nelson, Gunner E.; and Pearson, Tillmon H., 4,066,687, Cl. 260-535.00P.
Rifkin, Ellis B., 4,065,918, Cl. 60-274.000.
Wollensak, John C.; Ihrman, Kryn G.; and Elsey, Paul G., 4,066,562, Cl. 252-52.00R.

Euer, Hartmut; and Bartek, Gerhard, to Apparatebau Gauting GmbH. Spring system comprising an adjustable spring. 4,065,974, Cl. 73-430.000.

Evans, James M.: *See—*
Woo, James T. K.; and Evans, James M., 4,066,525, Cl. 204-181.000.

Evans, John M., Jr: *See—*
Mogavero, Louis N.; Johnson, Edwin G.; Evans, John M., Jr; and Albus, James S., 4,067,015, Cl. 343-225.000.

Evans, Robert E.: *See—*
Ellis, Lawrence D.; and Evans, Robert E., 4,065,824, Cl. 14-71.300.

Ex-Cell-O Corporation: *See—*
Barlow, Roland J., 4,066,007, Cl. 92-125.000.

Exxon Research & Engineering Co.: *See—*
Aldridge, Clyde L.; and Bearden, Roby, Jr., 4,066,530, Cl. 208-112.000.
Gallo, Donald J., 4,066,098, Cl. 137-615.000.
Long, Robert B.; Caruso, Fred A.; DeFeo, Richard J.; and Walker, David G., 4,066,679, Cl. 260-438.100.
Rao, Bhaskara M. L.; and Silbernagel, Bernard G., 4,066,824, Cl. 429-50.000.
van Brederode, Robert A., 4,066,608, Cl. 260-42.180.

Fagan, John C., to Amtron, Division of the Sippican Corporation. Baconweigher. 4,065,911, Cl. 53-53.000.

Fahrbach, Gerhard: *See—*
Falkenstein, Georg; Fahrbach, Gerhard; and Wulff, Harald, 4,066,580, Cl. 260-2.5AW.

Fairchild Camera and Instrument Corporation: *See—*
O'Brien, David, 4,066,473, Cl. 148-1.500.

Falkenstein, Georg; Fahrbach, Gerhard; and Wulff, Harald, to BASF Wyandotte Corporation. Process for the manufacture of polyisocyanurate foams. 4,066,580, Cl. 260-2.5AW.

Faraci, Rocco; Rescalli, Carlo; and Catini, Stefano, to Snamprogetti, S.p.A. Process for the addition of organic acids to acetylenic compounds contained in inorganic or organic hydrocarbon streams. 4,066,713, Cl. 260-677.00A.

Farina, Frederick P. Box spring construction. 4,065,818, Cl. 5-288.000.

Farnbach, John S. Binary counting system. 4,065,915, Cl. 58-23.00R.

Farr, Glyn Phillip Reginald, to Girling Limited. Servo-motors for vehicle braking systems. 4,066,005, Cl. 91-369.00B.

Farr, Glyn Phillip Reginald, to Girling Limited. Dual hydraulic braking systems for vehicles. 4,066,150, Cl. 188-1.00A.

Farukhi, Mohammad R.; Mataraza, George A.; and Wimer, Oley D., to Harshaw Chemical Company, The. Well-type scintillation assembly. 4,066,908, Cl. 250-483.000.

Faulstich, Marga; and Geffcken, Walter, to Jenaer Glaswerk Schott & Gen. Optical glasses with improved varying partial dispersion in the optical positional range of lanthanum crown glasses and lanthanum flint glasses. 4,066,464, Cl. 106-47.00Q.

Faure, Louis H., to International Business Machines Corporation. High density cable connector. 4,066,312, Cl. 339-48.000.

Fayard, William S.: *See—*
Gullotti, Damian V.; Fayard, William S.; and Wedgeworth, Wiley W., 4,066,476, Cl. 148-11.50A.
Gullotti, Damian V.; Fayard, William S.; and Wedgeworth, Wiley W., 4,066,480, Cl. 148-11.50A.

Fein, Marvin Michael: *See—*
Kiss, Kornel Dezso; Allan, John Leslie Hugh; and Fein, Marvin Michael, 4,066,610, Cl. 260-42.210.

Feinstein, Allen; and Fields, Ellis K., to Standard Oil Company (Indiana). Polyamide acids and polyesterimides from 1,3-adamantylene-bis-trimellitate dianhydrides. 4,066,622, Cl. 260-47.0CP.

Feldstein, George: *See—*
Smith, Robert E.; Chytil, Frank S.; Feldstein, George; and Swartz, Dorman J., 4,066,217, Cl. 242-25.00R.

Felix, Arthur Martin, to Hoffmann-La Roche Inc. Resolution of D,L-dehydroproline. 4,066,658, Cl. 260-326.200.

Fenner, Wolfgang. Framework joint. 4,065,890, Cl. 52-27.000.

Fenton, John William; Lee, Jerry Stevenson; and Buist, Richard James, to Borg-Warner Corporation. Counter-flow thermoelectric heat pump with discrete sections. 4,065,936, Cl. 62-3.000.

Fico, Sally S.: *See—*
Bloom, Melvin S.; and Fico, Sally S., 4,066,676, Cl. 260-402.500.

Fields, Ellis K.: *See—*
Feinstein, Allen; and Fields, Ellis K., 4,066,622, Cl. 260-47.0CP.

Fikentscher, Rolf: *See—*
Scharf, Emil; Fikentscher, Rolf; Auhorn, Werner; and Streit, Werner, 4,066,494, Cl. 162-164.0EP.

Fincher, Robert C.: *See—*
Ball, Dean M.; Fincher, Robert C.; and Orr, Clyde, Jr., 4,066,536, Cl. 209-155.000.

Fine, David H., to Thermo Electron Corporation. Method and apparatus for chromatographically analyzing a liquid sample. 4,066,409, Cl. 23-230.0PC.

Fine, David H.; Fronduto, John J.; and Rounbehler, David P., to Thermo Electron Corporation. N-nitroso compound analyzer with sample atomization. 4,066,411, Cl. 23-253.0PC.

Finney, Roy P.; and Lynch, Henry Wilfred, to Medical Engineering Corporation. Composite rod penile implant. 4,066,073, Cl. 128-79.000.

First National Bank of Chicago, The: *See—*
Schatz, Vernon L., 4,066,873, Cl. 235-487.000.

Fischer, Artur. Anchoring device for use in masonry and like structures. 4,065,996, Cl. 85-64.000.

Fischer, Kenneth Edmund. Airfoil, reduced profile, "Y" flow, hybrid. 4,066,226, Cl. 244-36.000.

Fisher, Gerald C.; and Scanland, Joseph E., to Roper Corporation. Safe cutter disc assembly for rotary lawn mower. 4,065,913, Cl. 56-295.000.

Fisher, Glenn: *See—*
Yoho, Leland E., 4,066,244, Cl. 256-1.000.

Fisons Limited: *See—*
Orr, Thomas Samuel Campbell; Hall, David Edward; and Mann, John, 4,066,756, Cl. 424-232.000.

Flanagan, John R.: *See—*
Waldrop, Thomas W.; and Flanagan, John R., 4,066,216, Cl. 241-190.000.

Fleig, Helmut: *See—*
Pommer, Ernst-Heinrich; Hagen, Helmut; and Fleig, Helmut, 4,066,775, Cl. 424-270.000.

Fleischer, John Martin; and Holmes, Richard Dwight, to International Business Machines Corporation. Impact position transducer for ink jet. 4,067,019, Cl. 346-75.000.

Flint, John R., to Bell & Howell Company. Information retrieval system having ramp motor control. 4,066,349, Cl. 353-25.000.

Flint, John R.: *See—*
Karp, Robert S.; and Flint, John R., 4,066,872, Cl. 353-26.00A.

Flugger, Ray T.: *See—*
Nelson, Lawrence B.; Mott, Stuart A.; and Flugger, Ray T., 4,065,857, Cl. 34-30.000.

FMC Corporation: *See—*
Gulbrantson, William, 4,067,004, Cl. 340-237.00R.

Follett, Michael John, to J. Sainsburg Limited. Process for vacuum packing and cooling meat cuts. 4,066,798, Cl. 426-393.000.

Food Research, Inc.: *See—*
McKee, Donald H., 4,066,796, Cl. 426-302.000.
Ford Aerospace & Communications Corporation: *See—*
Morrill, Daniel F., 4,066,931, Cl. 315-241.00R.
Ford-Dunn, Martin Douglas, to Ricardo & Co., Engineers (1927) Limited. Two-stroke I.C. engines. 4,066,050, Cl. 123-73.0SP.
Ford, Michael E.: *See—*
Dixon, Dale D.; Ford, Michael E.; and Mantell, Gerald J., 4,066,630, Cl. 260-77.50D.
Ford Motor Company: *See—*
Peng, Stephen Chung-Suen, 4,066,613, Cl. 260-42.540.
Forero, Jorge E.: *See—*
Swanson, Harold V.; and Forero, Jorge E., 4,066,372, Cl. 403-302.000.
Foster, Alan. Motor drive control arrangements. 4,066,941, Cl. 318-341.000.
Foster, Edson Perkins, to Foster Needle Company, Inc. Method and apparatus for forming a uniform felting needle barb. 4,065,955, Cl. 72-476.000.
Foster Needle Company, Inc.: *See—*
Foster, Edson Perkins, 4,065,955, Cl. 72-476.000.
Foster Wheeler Energy Corporation: *See—*
Daman, Ernest L., 4,066,738, Cl. 423-569.000.
Fowler, Frank C., to Atlas Powder Company. Recovery of nitrated compounds from water by distillation. 4,066,514, Cl. 203-11.000.
Fowler, James C.: *See—*
Buller, Paul L.; Chapman, William L.; Thomas, Bobby J.; and Fowler, James C., 4,066,992, Cl. 340-15.5MC.
Fowlie, William J. C. Desk stand for holding in operative position pocket calculators and other desk-top articles. 4,066,171, Cl. 211-69.100.
Fox, Edgar N. One piece elastic body suit. 4,065,814, Cl. 2-79.000.
Fradisc: *See—*
Pascal, Jean-Pierre, 4,066,152, Cl. 188-171.000.
Fraioli, Donato M., to Air Tech Industries Inc. Double wall fabric panel unit. 4,065,889, Cl. 52-2.000.
France Luzerne: *See—*
Gastineau, Charles; de Mathan, Olivier; and Dilly, Jan-Dominique, 4,066,633, Cl. 260-112.00R.
Frankle, Helmut; and Baum, Werner, to PEI, Inc. Flame jet tool for drilling cross-holes. 4,066,137, Cl. 175-14.000.
Franklin, Peter G.: *See—*
Costanza, Samuel T.; Franklin, Peter G.; Gebhardt, Frank L.; Israel, Jack D.; Moore, Charles R.; and Wheatley, Charles E., III, 4,066,964, Cl. 325-55.000.
Franz, Helmut, to PPG Industries, Inc. Method of tempering in a fluidized quenching medium. 4,066,430, Cl. 65-116.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef, 4,066,020, Cl. 104-7.00B.
Fray, Adrian Forrest; and Jones, David, to National Research Development Corporation. Liquid crystal light deflector. 4,066,334, Cl. 350-160.0LC.
Freeman, Norman A.: *See—*
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Freimuth, Franz: *See—*
Lind, Erwin; and Freimuth, Franz, 4,066,453, Cl. 96-1.00R.
Frentzen, Hermann Josef; Gerretz, Richard; and Henn, Ewald, to Mannesmann Aktiengesellschaft. Mechanical tube expander. 4,065,953, Cl. 72-393.000.
Fresnel, Jacques, to SLEEVER Societe de droit francais (S.a.r.l.). Apparatus for shrinking sleeves around containers. 4,066,866, Cl. 219-388.000.
Freudenschuss, Otto; Kantner, Otto; and Revy von Belvard, Peter, to Vockenhuber, Karl; and Hauser, Raimund. Sound-film camera. 4,066,345, Cl. 352-27.000.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Hoffmeister, Bernhard; and Schwarz, Wilhelm, 4,066,248, Cl. 266-216.000.
Seeger, Herbert, 4,066,957, Cl. 322-16.000.
Frisch, Kurt C.: *See—*
Ashida, Kaneyoshi; Frisch, Kurt C.; and Kordomenos, Panagiotis, 4,066,628, Cl. 260-77.50R.
Fritsch, Rudolf Paul, to C. F. Scheer & Cie. Apparatus for processing molten liquid plastics, particularly for extrusion of plastics. 4,066,097, Cl. 137-563.000.
Fronduto, John J.: *See—*
Fine, David H.; Fronduto, John J.; and Rounbehler, David P., 4,066,411, Cl. 23-253.0PC.
Fruh, Friedrich. Connecting element for wall or ceiling panels when constructed by a dry method. 4,065,901, Cl. 52-582.000.
Fuchs, Hermann; Kapaun, Gustav; and Meininger, Fritz, to Hoechst Aktiengesellschaft. Water-soluble fiber reactive phenyl-azo-naphthyl dyestuffs containing two sulfo groups in the phenyl moiety. 4,066,638, Cl. 260-196.000.
Fuji Photo Film Co., Ltd.: *See—*
Igarashi, Shunkichi; Okano, Takeshi; Takahama, Sho; and Hakamata, Yoshio, 4,066,354, Cl. 355-28.000.
Kato, Hisatoyo; and Miyahara, Junji, 4,066,332, Cl. 350-126.000.
Sasazawa, Koji; Dezawa, Shin-Ichiro; and Kitamoto, Tatsuji, 4,066,564, Cl. 252-62.560.
Sasazawa, Koji; Dezawa, Shin-Ichiro; and Kitamoto, Tatsuji, 4,066,565, Cl. 252-62.560.
Sera, Hidefumi; and Nagao, Kameji, 4,066,636, Cl. 260-117.000.
Shimamura, Isao; Ishiguro, Shoji; and Ogawa, Junkichi, 4,066,461, Cl. 96-66.300.
Fuji Seiki Machine Works, Ltd.: *See—*
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Fujita, Teizo; and Ohashi, Tosiro, to Izumi Denki Corporation. Apparatus for detachably mounting electrical assembly units to supporting panels. 4,066,838, Cl. 174-48.000.
Fukunaka, Shiro: *See—*
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Fuller, Ralph N.: *See—*
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Funabiki, Kyohei; Matsushima, Noriaki; Tachikawa, Toshiyuki; and Ikeda, Kazuichi, to Sumitomo Durez Company, Ltd. Cold-curing binder for foundry sand cores and molds. 4,066,588, Cl. 260-22.0TN.
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Furtah, Reginald D., to Essex Group, Inc. Override clip assembly. 4,066,369, Cl. 403-115.000.
Futaba Denshi Kogyo K. K.: *See—*
Takagi, Toshinori; Morimoto, Kiyoshi; and Utamura, Yukihiko, 4,066,527, Cl. 204-192.00N.
Futterweit, Adolf: *See—*
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G. D. Searle & Co.: *See—*
Adelstein, Gilbert W.; Dajani, Esam Z.; and Yen, Chung Hwai, 4,066,654, Cl. 260-293.690.
Meresz, Henry; and Tranquilla, Michael N., 4,065,978, Cl. 74-82.000.
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GAF Corporation: *See—*
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Waxman, Burton H.; Mourning, Michael C.; and Panasik, Theodore, 4,066,456, Cl. 96-29.00D.
Gagel, Ernst: *See—*
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Gaicki, Stanley, to Motorola, Inc. Ultrasonic bonding head. 4,067,039, Cl. 357-65.000.
Gallani, Zvi; and Sullivan, Joseph A., to Raytheon Company. Voltage controlled Clapp oscillator having output isolated from tuned circuit. 4,066,983, Cl. 331-117.00R.
Gallo, Donald J., to Exxon Research & Engineering Co. Marine loading and bunkering arrangement. 4,066,098, Cl. 137-615.000.
Ganguly, Udaya: *See—*
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Gant, Guy W.: *See—*
Davis, Jerry B.; and Gant, Guy W., 4,066,128, Cl. 166-315.000.
Garcia, Roberto, to Petroleo Brasileiro S.A. Petrobras. Process for producing premium coke and aromatic residues for the manufacture of carbon black. 4,066,532, Cl. 208-131.000.
Garcowski, Ronald J.; and Davis, William A., to Addressograph-Multigraph Corporation. Blanket cleaner for duplicating machines. 4,066,017, Cl. 101-425.000.
Gardner-Denver Company: *See—*
Conley, Fred Miller, 4,066,140, Cl. 177-134.000.
Gargour, Habib T. Vehicle carriers. 4,066,289, Cl. 296-1.00A.
Garrett, Michael David, to Medi-Physics, Inc. Tc-99m sulfur colloid radiopharmaceuticals. 4,066,742, Cl. 424-1.000.
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Gaspar, Randle; and Burk, Claud A. Underwater radiographic system. 4,066,899, Cl. 250-358.00P.
Gassmann, Michael, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH. Enclosed high-pressure electric discharge lamp structure with cable terminal. 4,066,888, Cl. 362-223.000.
Gastineau, Charles; de Mathan, Olivier; and Dilly, Jan-Dominique, to France Luzerne. Process for the treatment of green, leafy plants for the extraction of proteins in the pressing juices and for economical dehydration of cake. 4,066,633, Cl. 260-112.00R.
Gates Rubber Company, The: *See—*
Redmond, John D., Jr., 4,066,732, Cl. 264-229.000.
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Geffcken, Walter: *See—*
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Gehring, Johann: *See—*
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General Atomic Company: *See—*
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General Battery Corporation: *See—*
Eberle, William J., 4,066,825, Cl. 429-71.000.
General Electric Company: *See—*
Axelrod, Robert Jay, 4,066,611, Cl. 260-45.80A.
Borman, Willem F. H.; and Reilly, Eugene P., 4,066,627, Cl. 260-75.00M.
LeBlanc, Oliver H., Jr.; and Ward, William J., III, 4,066,646, Cl. 23-259.000.
Mark, Victor, 4,066,618, Cl. 260-45.85T.
Milkovic, Miran, 4,066,959, Cl. 324-141.000.
Milkovic, Miran, 4,066,960, Cl. 324-142.000.
Moeller, Richard E., 4,066,594, Cl. 260-29.20M.
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Rublack, Wilfred, 4,066,924, Cl. 313-408.000.
Stitch, Richard C., 4,066,094, Cl. 137-387.000.
Suthers, Charles E., 4,066,955, Cl. 363-68.000.
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General Motors Corporation: *See—*
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Gibbs, James Kiel, to Borg-Warner Corporation. Impeller disconnect and brake mechanism. 4,066,157, Cl. 192-3.240.
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Giessner, Jean, to BBC Brown Boveri & Company Limited. Apparatus for measuring the slip of locomotive wheels and preventing sliding thereof. 4,065,975, Cl. 73-510.000.
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Gillette, Robert H. Guided honing tool. 4,065,881, Cl. 51-346.000.
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Givens, Wyatt W., to Mobil Oil Corporation. Coal logging system. 4,066,892, Cl. 250-270.000.
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Goettl, William H. Air conditioning system. 4,066,118, Cl. 165-18.000.
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Gordon, Abraham, to Technicon Instruments Corporation. Liquid sampler. 4,065,973, Cl. 73-423.00A.
Gordon, Murray A. Toe ring base and ornamental toe ring. 4,065,940, Cl. 63-2.000.
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Graham, Kenneth A., to Chrysler Corporation. Throttle body having a novel throttle blade. 4,066,721, Cl. 261-62.000.
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Greer, Michael M. Pocket finger exercise board. 4,065,995, Cl. 84-465.000.
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Gresh, Peter P. Rust retarder applicator. 4,066,146, Cl. 184-1.00R.
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Multi-layer radiator of plastic material and process for its manufacture. 4,066,122, Cl. 165-175.000.

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Gundry, Kenneth James, to Dolby Laboratories, Inc. Electrically variable impedance circuits. 4,066,914, Cl. 307-237.000.

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Gutmann, Walter: *See—*
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Guttmann, Hilda: *See—*
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Guyer, August, to Escher Wyss Limited. Filtration apparatus. 4,066,554, Cl. 210-342.000.

Gysin, Max. Printing roller. 4,065,841, Cl. 29-121.100.

Haack, Erich: *See—*
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Haacke, Harri: *See—*
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Haberle, Fritz; Riechers, Daniel; and Hochrathner, Alfred, to Daimler-Benz Aktiengesellschaft. Bumper for motor vehicles. 4,066,286, Cl. 293-87.000.

Habermeier, Jurgen: *See—*
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Hachisu, Takeshi; and Uchida, Akinari, to Hitachi, Ltd. Oil-recovering material and process for preparing and using the same. 4,066,539, Cl. 210-36.000.

Hadley, Charles F.: *See—*
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Haemer, Laurence F.: *See—*
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Haffer, Gregor: *See—*
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Hagenuk Vormals Neufeldt & Kuhnke GmbH: *See—*
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Hager, Lowell T., to Clean Power Systems, Inc. Positive crankcase ventilation system. 4,066,055, Cl. 123-119.00B.

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Haglund, Kjell, to Aktiebolaget Karlstads Mekaniska Werkstad. Apparatus for mounting and dismounting a submerged propeller unit for a floating body. 4,066,034, Cl. 115-34.00R.

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Hahn, Heinz-Dieter; and Weber, Jurgen, to Ruhrchemie AG. Process for purifying the waste water produced in the process of producing ester plasticizers. 4,066,835, Cl. 560-98.000.

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Winnick, Charles Nathan, 4,066,575, Cl. 252-475.000.

Hale, David Jerry, to Brunswick Corporation. Cylinder head mounting apparatus for internal combustion engines. 4,066,057, Cl. 123-193.0CH.

Hall, Daniel L.; and Dunivan, Neal Duane, to Trim-Line, Inc. Ornamental protective trim strip for motor vehicles. 4,066,285, Cl. 293-62.000.

Hall, David Edward: *See—*
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Hall, James Robert, to RCA Corporation. Circuit for inhibition of autogenetic false alarms in a collision avoidance system. 4,067,010, Cl. 343-6.8LC.

Hall, Lowell R., to Caterpillar Tractor Co. Metering slot configuration for a valve spool. 4,066,239, Cl. 251-31.000.

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Hamashima, Yoshio; Yoshioka, Mitsuru; Tanida, Hiroshi; Tsuji, Teruji; Narisada, Masayuki; Komeno, Taichiro; and Nagata, Wataru. Method for cyclization to give cephem ring. 4,066,641, Cl. 544-17.000.

Hamilton, Charles W.; and Kleider, Alfred, to United States of America, Army. Rotor tip light control. 4,066,890, Cl. 250-199.000.

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Hamori, Alfred Steven: *See—*
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Hanna, Ward T.; Drennan, John J.; and Staroska, John T., to Keebler Company. Recloseable package. 4,066,167, Cl. 206-627.000.

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Hargreaves, William; and Hargreaves, Olivia Nancy. Knock-down shipping reel for flexible cable. 4,066,224, Cl. 242-115.000.

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Harries, David Anthony, to Girling Limited. Modulator assemblies for vehicle hydraulic braking systems. 4,066,301, Cl. 303-115.000.

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Harris, Jesse R., to Phillips Petroleum Company. Reforming process using chromium trioxide-graphite intercalation catalyst. 4,066,712, Cl. 260-668.00D.

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Harris, Norman; and Naden, David, to Power-Gas Corporation Limited, The. Catalytic oxidation. 4,066,704, Cl. 260-604.00R.

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Harshaw Chemical Company, The: *See—*
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Harwood, William James; and Snyder, Robert P., to Harwood, William James. Portable abrasion tool. 4,065,886, Cl. 51-166.0FB.
Hashiguchi, Setsuo, to Ichikoh Industries Limited. Breakaway mirror mounting. 4,066,235, Cl. 248-482.000.
Hashimoto, Mitsuru, to Kabushiki Kaisha Ricoh. Electrophotographic light-sensitive material containing indenothiophenone or its derivative and process of preparing indenothiophenone and its derivative. 4,066,454, Cl. 96-1.50R.
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Heiser, Joachim, to Robert Bosch G.m.b.H. Flow regulating system. 4,066,006, Cl. 91-433.000.
Heitmann, Arthur C., to Owens-Corning Fiberglas Corporation. Method and apparatus for producing feeders for supply of heat softenable materials. 4,066,864, Cl. 219-121.0EM.
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Henkin, Robert I., to United States of America, Health, Education and Welfare. Method for total protein fractionation and analysis of human saliva. 4,066,405, Cl. 23-230.00B.
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Phalangas, Charalambos J., 4,066,524, Cl. 204-159.230.
Hermanson, Fred H.: *See*—
Shank, Richard S.; and Hermanson, Fred H., 4,065,895, Cl. 52-210.000.
Hermeyer, Edward J. Clamp-on level holder. 4,066,232, Cl. 248-226.200.
Herzog, Hans; Buxbaum, Lothar; Kainmuller, Thomas; and Habermeier, Jurgen, to Ciba-Geigy Corporation. Linear polyesters based on heterocyclic dicarboxylic acids. 4,066,626, Cl. 260-75.00N.
Hesketh, Geoffrey: *See*—
Nobbs, William Harry; Bowker, Harold; and Tyburski, Peter Frank, 4,066,197, Cl. 224-42.010.
Hess, Stanley R., to Cordis Corporation. Contact device for muscle stimulation. 4,066,085, Cl. 128-418.000.
Hesseltine, Clifford W.: *See*—
Kanda, Hiroshi; Wang, Hwa L.; and Hesseltine, Clifford W., 4,066,792, Cl. 426-41.000.
Hesston Corporation: *See*—
Adee, Raymond A., 4,066,274, Cl. 280-411.00A.
Heuner, Robert Charles; Goldman, Michael Barnett; Niemiec, Stanley Joseph; and Morton, George Ira, to RCA Corporation. Protection circuitry for insulated-gate field-effect transistor (IGFET) circuits. 4,066,918, Cl. 307-304.000.
Hexcel Corporation: *See*—
Tan, Gene S. T., 4,066,486, Cl. 156-48.000.
Heys, George, Jr., to NCR Corporation. Keyboard switch assembly having interchangeable cover plate, indicating layer and actuator switch assembly in any operative combination. 4,066,850, Cl. 200-5.00A.
Hickman, John S. Weatherized system for motorcycle. 4,066,291, Cl. 296-78.100.
Higashida, Susumu: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou, 4,066,615, Cl. 260-45.8NT.
Hijikata, Akiko: *See*—
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tonomura, Shinji; Tamao, Yoshikuni; Tezuka, Tohru; and Hijikata, Akiko, 4,066,758, Cl. 424-244.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,066,759, Cl. 424-244.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,066,773, Cl. 424-267.000.
Hill, Jan, to AB Tellusond. Method and device for examining pulp for the presence of shives. 4,066,492, Cl. 162-49.000.
Hillebrand, Michael J.: *See*—
Halton, Murray; Dow, Norris F.; Dow, Richard M.; and Hillebrand, Michael J., 4,066,104, Cl. 139-11.000.
Hillmann, Reinhart Michael: *See*—
Johnston, Gordon Boyd; Hillmann, Reinhart Michael; Kregler, Helmuth Martin; Janson, Bertil Sven; and Strandberg, Hasse Eivind, 4,066,304, Cl. 308-201.000.
Hilti Aktiengesellschaft: *See*—
Craig, Alexander Robertson, 4,066,807, Cl. 427-282.000.
Jochum, Peter; and Seghezzi, Hans Dieter, 4,066,198, Cl. 227-8.000.
Jochum, Peter; and Seghezzi, Hans Dieter, 4,066,199, Cl. 227-10.000.
Hiraiwa, Yasuyuki: *See*—
Hattori, Shuzo; Hiramatsu, Tadao; Katayama, Sunao; Ozawa, Hidenori; and Hiraiwa, Yasuyuki, 4,066,338, Cl. 350-161.00W.
Hirakawa, Hayao: *See*—
Tosaka, Osamu; Morioka, Hajimu; Hirakawa, Hayao; Ishii, Kenji; Kubota, Koji; and Hirose, Yoshio, 4,066,501, Cl. 195-29.000.
Hiramatsu, Tadao: *See*—
Hattori, Shuzo; Hiramatsu, Tadao; Katayama, Sunao; Ozawa, Hidenori; and Hiraiwa, Yasuyuki, 4,066,338, Cl. 350-161.00W.
Hirata, Noritsugu: *See*—
Toyama, Masamichi; Takigawa, Tomoshi; Hirata, Noritsugu; and Ishikawa, Kazuo, 4,066,346, Cl. 352-72.000.
Hiroishi, Takashi: *See*—
Mohri, Yoshio; Hiroishi, Takashi; Sano, Kinzi; Huruya, Koichi; Muramoto, Tadashi; and Tao, Masato, 4,066,465, Cl. 106-50.000.
Hirose, Yasunori, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic organ with a three-finger chord and one-finger automatic chord playing mode selector. 4,065,993, Cl. 84-1.030.
Hirose, Yoshio: *See*—
Tosaka, Osamu; Morioka, Hajimu; Hirakawa, Hayao; Ishii, Kenji; Kubota, Koji; and Hirose, Yoshio, 4,066,501, Cl. 195-29.000.
Hiroshima, Yoshimitsu: *See*—
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Hirota, Toshio. Hybrid battery electric drive. 4,066,936, Cl. 318-139.000.

Hirschmann, Ralph F.: *See*—
Veber, Daniel F.; Nutt, Ruth F.; and Hirschmann, Ralph F., 4,066,749, Cl. 424-177.000.
Hitachi Chemical Company, Ltd.: *See*—
Tanuma, Tuneo; and Yoshida, Teruo, 4,066,586, Cl. 260-22.0CB.
Hitachi, Ltd.: *See*—
Hachisu, Takeshi; and Uchida, Akinari, 4,066,539, Cl. 210-36.000.
Itoh, Tomo; and Yanagisawa, Syozo, 4,066,091, Cl. 137-79.000.
Maeda, Takesi; Kohmoto, Mahito; and Yonezawa, Seiji, 4,067,044, Cl. 358-128.000.
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Ohhinata, Ichiro, 4,066,915, Cl. 307-238.000.
Okamoto, Yukio; and Mizushima, Masashi, 4,066,929, Cl. 315-169.0TV.
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Shimazoe, Michitaka; Nakamura, Kousuke; Matsushita, Yasuo; Shimada, Satoshi; Yamada, Kazuji; and Takahashi, Yukio, 4,065,971, Cl. 73-727.000.
Hjelte, Sven Roland; and Eksell, Lennart, to Svensk Tryckgjuntning SH AB. Device in connection with locking reeling means for safety belts for vehicles. 4,066,222, Cl. 242-107.40B.
Hochiki Corporation: *See*—
Takeuchi, Takeshi; and Masuda, Hajime, 4,066,966, Cl. 325-308.000.
Hochman, Arthur, to Art Phyl Creations. Bodies to be attached to single-prong hooks. 4,066,169, Cl. 211-57.100.
Hochrathner, Alfred: *See*—
Haberle, Fritz; Riechers, Daniel; and Hochrathner, Alfred, 4,066,286, Cl. 293-87.000.
Hochtemperatur-Kernkraftwerk GmbH (HKG) Gemeinsames Europaisches Unternehmen: *See*—
Buthmann, Hans-Peter, 4,066,499, Cl. 176-38.000.
Hodgson, David A., to International Power Pole, Ltd. Illuminated ski pole. 4,066,889, Cl. 362-102.000.
Hoechst Aktiengesellschaft: *See*—
Bork, Siegfried; and Sam, Georg, 4,066,576, Cl. 252-511.000.
Clasen, Hermann, 4,066,698, Cl. 260-569.000.
Fuchs, Hermann; Kapaun, Gustav; and Meininger, Fritz, 4,066,638, Cl. 260-196.000.
Gross, Erwin; and Vowinkel, Hans, 4,066,063, Cl. 126-271.000.
Gross, Erwin; and Vowinkel, Hans, 4,066,122, Cl. 165-175.000.
Holst, Arno; Lask, Helmut; and Kostrzewa, Michael, 4,066,828, Cl. 536-87.000.
Kunstmann, Rudolf; and Kaiser, Joachim, 4,066,764, Cl. 424-248.540.
Lind, Erwin; and Freimuth, Franz, 4,066,453, Cl. 96-1.00R.
Millauer, Hans; and Pistorius, Rudolf, 4,066,708, Cl. 260-613.00D.
Reuschling, Dieter-Bernd; and Jensen, Harald, 4,066,690, Cl. 260-544.00Y.
Weber, Helmut; Muth, Karl; Weyer, Rudi; Aumuller, Walter; and Haack, Erich, 4,066,639, Cl. 260-239.0BF.
Hoehn, Hans: *See*—
Denzel, Theodor; and Hoehn, Hans, 4,066,643, Cl. 260-256.40F.
Denzel, Theodor; and Hoehn, Hans, 4,066,644, Cl. 260-256.40F.
Denzel, Theodor; and Hoehn, Hans, 4,066,645, Cl. 260-256.40F.
Hoffman-La Roche Inc.: *See*—
Boller, Arthur; Cereghetti, Marco; and Scherrer, Hanspeter, 4,066,570, Cl. 252-299.000.
Hoffmann, Jurgen; Hofmockel, Albrecht; and Lepie, Gunther, to Kraftwerk Union Aktiengesellschaft. Shut-off and safety device for a live steam line in a pressurized water reactor. 4,066,498, Cl. 176-38.000.
Hoffmann, Kurt, to Siemens Aktiengesellschaft. Line for transporting charges from storage elements in a storage field. 4,067,001, Cl. 365-174.000.
Hoffmann-La Roche Inc.: *See*—
Adams, Jim Mills; and deZabala, Edward Francis, 4,066,173, Cl. 214-1.00C.
Cohen, Michael Robert; Kierstead, Richard Wightman; and Tilley, Jefferson Wright, 4,066,695, Cl. 260-564.00E.
Felix, Arthur Martin, 4,066,658, Cl. 260-326.200.
Gillessen, Dieter; Studer, Rolf; and Trzeciak, Arnold, 4,066,635, Cl. 260-112.50R.
Rosen, Perry, 4,066,666, Cl. 260-340.9AS.
Hoffmeister, Bernhard; and Schwarz, Wilhelm, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Charging device. 4,066,248, Cl. 266-216.000.
Hofmann, Corris Mabelle: *See*—
Safir, Sidney Robert; and Hofmann, Corris Mabelle, 4,066,647, Cl. 260-268.0TR.
Hofmann, Wilfried: *See*—
Paulus, Rudolf; Gutmann, Walter; and Hofmann, Wilfried, 4,066,328, Cl. 350-7.000.
Hofmockel, Albrecht: *See*—
Hoffmann, Jurgen; Hofmockel, Albrecht; and Lepie, Gunther, 4,066,498, Cl. 176-38.000.
Hoks, Dirk, to Stork-Werkspoor Sugar B.V. Method of feeding material for centrifugation to a continuously operating centrifuge, and a centrifuge for performing the method. 4,066,547, Cl. 210-78.000.
Holliday, Leland Robert; and Poe, Ronald Laurence, to Continental Oil Company. Transesterification of borate esters for producing secondary alcohols. 4,066,682, Cl. 260-462.00R.
Holloway, David John, to USM Corporation. Pull through blind riveting tool. 4,065,952, Cl. 72-391.000.
Holmes, Richard Dwight: *See*—
Fleischer, John Martin; and Holmes, Richard Dwight, 4,067,019, Cl. 346-75.000.
Holst, Arno; Lask, Helmut; and Kostrzewa, Michael, to Hoechst Aktiengesellschaft. Process for the production of water-adsorbing cellulose ethers. 4,066,828, Cl. 536-87.000.
Holt, Hammond H.: *See*—
Kelly, Joseph D.; Cohen, Emory M.; Henley, Barry K.; Holt, Hammond H.; and Agalsoff, John, 4,067,049, Cl. 360-14.000.
Holub, Fred F.; and Alter, H. Ward, to Terradex Corporation. Method and apparatus for underground deposit detection. 4,065,972, Cl. 73-421.50R.
Homae, Taisaburo: *See*—
Koide, Hiroshi; Iida, Katsuhiko; Ataka, Hisanori; and Homae, Taisaburo, 4,066,350, Cl. 353-27.00R.
Homan, Gary R.; and Lee, Chi-Long, to Dow Corning Corporation. Sulfur containing silicone elastomer and method of preparation. 4,066,603, Cl. 260-37.0SB.
Honeycutt, Bass. Tobacco harvester. 4,066,176, Cl. 214-43.000.
Honeywell, Inc.: *See*—
Quinn, Peter T., 4,067,024, Cl. 354-23.00R.
Hooker Chemicals & Plastics Corporation: *See*—
Lemper, Anthony L.; Witschard, Gilbert; and Pattison, Victor A., 4,066,612, Cl. 260-42.530.
Hooper, Bernard. Loop driven vehicles. 4,066,142, Cl. 180-33.00A.
Hope Co., Ltd.: *See*—
Murata, Masahiro, 4,066,277, Cl. 280-626.000.
Horiguchi, Shojiro; Nakamura, Michiei; and Sugito, Yoshifumi, to Dainichiseika Color & Chemicals Mfg. Co., Ltd. Anti-corrosive organic pigment. 4,066,462, Cl. 106-14.000.
Horiuchi, Hideo: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou, 4,066,615, Cl. 260-45.8NT.
Horizons Incorporated, a division of Horizons Research Incorporated: *See*—
Bachman, Paul L.; and Moskal, John J., 4,066,459, Cl. 96-45.200.
Horn, Richard E., to Pitt Metals and Chemicals, Inc. Production of potassium or sodium stannate. 4,066,518, Cl. 204-86.000.
Hornkohl, Owen T., to Angelica Corporation. Guiding, stitching and delivering system. 4,066,028, Cl. 112-121.290.
Horton, Chauncey M., Jr.: *See*—
Bierenfeld, Herbert H.; McGonigal, Charles; Horton, Chauncey M., Jr.; and Kelsey, John A., 4,066,317, Cl. 339-91.00R.
Goodrich, Allen R.; Horton, Chauncey M., Jr.; Thaeler, Leigh M.; and Toivola, John O., 4,066,320, Cl. 339-98.000.
Houdard, Jean-Pierre, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Sampled signal processing device. 4,066,881, Cl. 364-726.000.
Hough, Edmund Alan, to Imperial Chemical Industries Limited. Gloves. 4,065,826, Cl. 15-227.000.
Hounsfield, Godfrey Newbold; and Langstone, Peter George, to EMI Limited. Scanning radiographic apparatus. 4,066,906, Cl. 250-445.00T.
Houston, Elmer. Solar heating system. 4,066,062, Cl. 126-271.000.
Howard, Curtiss Gilmore, to United Technologies Corporation. Tool element placement means. 4,066,377, Cl. 408-1.00R.
Howard, Eddie. Mobile rack for refuse containers. 4,066,172, Cl. 211-78.000.
Howe, Robert K., to Monsanto Company. Plant growth regulators. 4,066,435, Cl. 71-86.000.
Hoyer, William A.; Johnson, Lowell W.; and Schoenenberger, Richard J., to Universal Oil Products Company. Continuous system for providing a catalytic coating on support members. 4,066,801, Cl. 427-8.000.
HT Management Company: *See*—
McGill, James C.; and Scott, William N., 4,066,423, Cl. 55-48.000.
Huang, Yueh, to Lee Hon Corporation. On-wall umbrella holder. 4,066,170, Cl. 211-63.000.
Huber, John G.; and Gianuzzi, Ottavio, to Grumman Aerospace Corporation. Modular vacuum work area. 4,066,249, Cl. 269-21.000.
Hudson, Kirk R. Ball player's glove. 4,065,813, Cl. 2-19.000.
Hughes Aircraft Company: *See*—
Lim, Hong Sup, 4,066,569, Cl. 252-299.000.
Platt, Vernon H.; and Wilmot, Richard D., 4,067,012, Cl. 343-7.00A.
Hughes, Amy Gray, to Procter & Gamble Company, The. U-shape intravaginal device. 4,066,075, Cl. 128-127.000.
Hughes, Kingdon R. Copy machine table. 4,066,023, Cl. 108-50.000.
Hughes, O. Richard, to Celanese Corporation. Polybenzimidazole fiber supported catalyst. 4,066,705, Cl. 260-604.0HF.
Hugon, Pierre: *See*—
Beregi, Laszlo; Hugon, Pierre; Pascaud, Xavier; and Poignant, Jean-Claude, 4,066,662, Cl. 260-326.850.
Hultgren, Karl Sten Rudolf; and Svensson, Sven-Hakan, to AB Bofors. Magazine for tank. 4,065,999, Cl. 89-36.00H.
Humber, Leslie G.: *See*—
Demerson, Christopher A.; Humber, Leslie G.; Santroch, George; Dobson, Thomas A.; and Jirkovsky, Ivo, 4,066,763, Cl. 424-246.000.
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,066,779, Cl. 424-274.000.

Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,066,780, Cl. 424-274.000.
Hungerford, Gordon P., to Mobil Oil Corporation. Method of making polymeric acrylonitrile films. 4,066,731, Cl. 264-216.000.
Hunsucker, Jerry H., to IMC Chemical Group, Inc. Method of controlling the growth of bacteria, fungi and algae using members of the class of oxazolidines. 4,066,433, Cl. 71-67.000.
Hunt, Donald F.; and Stafford, George C., Jr., to University of Virginia. Positive and negative ion recording system for mass spectrometer. 4,066,894, Cl. 250-292.000.
Hunt, Morris Dean. Work transport apparatus for use with a button attachment machine. 4,066,026, Cl. 112-121.150.
Huntington Alloys, Inc.: *See—*
Smith, Darrell Franklin, Jr.; Clatworthy, Edward Frederick; and Wenschhof, Donald Edward, Jr., 4,066,447, Cl. 75-122.000.
Huntington, Robert Charles, to Motorola, Inc. Sample and hold circuit. 4,066,919, Cl. 307-353.000.
Huntsinger, Arnold G. Stop motion for drawing frames. 4,065,831, Cl. 19-.250.
Hurst, Robert L.: *See—*
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Huruya, Koichi: *See—*
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Hutchison, Robert J.: *See—*
Pearce, Phillip W.; and Hutchison, Robert J., 4,066,969, Cl. 328-5.000.
Hutson, Jearld L. Semiconductor device package and method of making same. 4,067,041, Cl. 357-80.000.
Hwa, Chih Ming, to Chemed Corporation. Corrosion inhibition. 4,066,398, Cl. 21-2.70A.
Hydragon Corporation: *See—*
Earnest, Ernest R., 4,066,381, Cl. 415-202.000.
Hyster Company: *See—*
Ott, James I.; and Schwab, Delmar G., 4,065,922, Cl. 60-445.000.
I-T-E Imperial Corporation: *See—*
Clark, William Randolph, 4,067,054, Cl. 361-91.000.
Krueger, Keith T., 4,066,989, Cl. 335-9.000.
I.W.S. Nominee Company Limited: *See—*
Abel, Heinz; and Topfl, Rosemarie, 4,066,392, Cl. 8-127.500.
Ichikawa, Toshiyuki: *See—*
Nakatani, Kiyoshi; Imamura, Juichi; Ichikawa, Toshiyuki; Takeuchi, Kouichi; and Kotaka, Kenji, 4,066,707, Cl. 260-613.00R.
Ichikoh Industries Limited: *See—*
Hashiguchi, Setsuo, 4,066,235, Cl. 248-482.000.
Ichinose, Shiro. Driving method and apparatus. 4,065,980, Cl. 74-404.000.
ICI Americas Inc.: *See—*
Shay, Barry M.; and Santacecilia, Remo, 4,066,558, Cl. 252-8.900.
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Igarashi, Shunkichi; Okano, Takeshi; Takahama, Sho; and Hakamata, Yoshio, to Fuji Photo Film Co., Ltd. Microfilm apparatus. 4,066,354, Cl. 355-28.000.
Ignatjev, Vladimir. Propeller disk projectile. 4,066,018, Cl. 102-67.000.
Iguchi, Susumu: *See—*
Yamaguchi, Kaichiro; and Iguchi, Susumu, 4,066,421, Cl. 48-213.000.
Ihrman, Kryn G.: *See—*
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Iida, Katsuhiko: *See—*
Koide, Hiroshi; Iida, Katsuhiko; Ataka, Hisanori; and Homae, Taisaburo, 4,066,350, Cl. 353-27.00R.
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Ikeda, Shigeho: *See—*
Asai, Soichiro; Matsuishi, Tsutomu; Matsushita, Katsunobu; Ikeda, Shigeho; Kobayashi, Kaetsu; and Maruyama, Hiromasa, 4,066,502, Cl. 195-47.000.
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Sato, Ryuichi; Ishikawa, Akira; Ishida, Yukihito; Sato, Hiroshi; Tomisawa, Setsuo; Toyoshima, Shigeshi; and Ikegami, Shiro, 4,066,678, Cl. 260-429.00R.
Ikemura, Akio, to Yoshida Kogyo Kabushiki Kaisha. Latch for windows or doors. 4,066,284, Cl. 292-62.000.
Illinois Tool Works Inc.: *See—*
Klygis, Mindaugas Julius, 4,066,166, Cl. 206-427.000.
Imamura, Juichi: *See—*
Nakatani, Kiyoshi; Imamura, Juichi; Ichikawa, Toshiyuki; Takeuchi, Kouichi; and Kotaka, Kenji, 4,066,707, Cl. 260-613.00R.
IMC Chemical Group, Inc.: *See—*
Hunsucker, Jerry H., 4,066,433, Cl. 71-67.000.
Imperial Chemical Industries Limited: *See—*
Andrews, Timothy Douglas, 4,066,804, Cl. 427-98.000.
Bent, Keith Joseph; and Turner, John Angus William, 4,066,786, Cl. 424-313.000.
Blackhall, Alexander; Brydon, Donald Lithgow; and Seddon, John David, 4,066,601, Cl. 260-30.80R.
Brittain, David Robert; Brown, Edward Douglas; Hepworth, Walter; and Stacey, Gilbert Joseph, 4,066,651, Cl. 260-287.00K.
Hough, Edmund Alan, 4,065,826, Cl. 15-227.000.
Kelly, Roger Sidney Arthur; and Wilson, John Robert, 4,066,820, Cl. 428-483.000.
Mansfield, John Rickard, 4,066,528, Cl. 204-195.00T.
Imperial Metal Industries (Kynoch) Limited: *See—*
Gidley, John Arthur Frederick; Irving, Barry Frederick; and Johnson, Barry Keith, 4,066,177, Cl. 214-152.000.
Imura, Toshinori: *See—*
Kuramoto, Yoshio; Imura, Toshinori; and Kikukawa, Yoshiiku, 4,067,030, Cl. 354-139.000.
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Kameda, Hiromi; and Inagaki, Sanji, 4,066,352, Cl. 355-3.0TE.
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Industriewerk Nachf. Seifert & Co. KG: *See—*
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Ingebrigtsen, Kjell A.: *See—*
Stern, Ernest; and Ingebrigtsen, Kjell A., 4,066,984, Cl. 333-30.00R.
Institutul National Pentru Creatie Stintifica si Tehnica - Increst: *See—*
Teodorescu, Gheorghe Marcel; and Popa, Aurel, 4,066,049, Cl. 123-48.00R.
Inter Innovation AB: *See—*
Lundbald, Leif Jorgen I.; and Ek, Jan Olof, 4,066,253, Cl. 271-4.000.
International Business Machines Corporation: *See—*
Alpaugh, Warren Alan; Macur, George Joseph; and Vlasak, Gary Paul, 4,066,809, Cl. 427-444.000.
Chang, Hsu, 4,067,002, Cl. 365-43.000.
Doran, Samuel K.; and Perkins, Merlyn H., 4,066,863, Cl. 219-121.0EM.
Faure, Louis H., 4,066,312, Cl. 339-48.000.
Fleischer, John Martin; and Holmes, Richard Dwight, 4,067,019, Cl. 346-75.000.
Park, Kyu C.; and Reisman, Arnold, 4,065,840, Cl. 29-25.140.
Ruh, Wolf-Dieter; and Trippel, Gerhard, 4,066,491, Cl. 156-644.000.
Stuckert, Paul E., 4,066,458, Cl. 96-41.000.
Wheeler, Delwyn Roche, Jr., 4,066,883, Cl. 235-304.000.
International Harvester Company: *See—*
Phillips, Carmen S.; Beyer, Ralph E.; and Sepich, Gerald E., 4,065,914, Cl. 56-341.000.
Vidakovic, Aleksandar; Urman, Stanley; and Rudny, Donald F., 4,066,047, Cl. 123-41.120.
International Minerals and Chemical Corporation: *See—*
Currier, James W., 4,066,443, Cl. 75-41.000.
International Nickel Company, Inc., The: *See—*
Clark, Ian Sidney Rex; Pargeter, John Kenneth; and Ward, John Oliver, 4,066,117, Cl. 164-46.000.
Haeberle, Ronald Mason, Jr., 4,066,448, Cl. 75-171.000.
International Power Pole, Ltd.: *See—*
Hodgson, David A., 4,066,889, Cl. 362-102.000.
International Telephone and Telegraph Corporation: *See—*
Levine, Arnold M., 4,066,981, Cl. 331-108.00B.
Piper, Jack Richard; and Kaczmarek, Leo W., 4,066,858, Cl. 200-84.00C.
Taylor, Robert L., 4,066,884, Cl. 362-16.000.
Interpace Corporation: *See—*
Swanson, Harold V.; and Forero, Jorge E., 4,066,372, Cl. 403-302.000.
Iobst, Stanley A.: *See—*
Eldred, Roger J.; Iobst, Stanley A.; and Abu-Isa, Ismat A., 4,066,590, Cl. 260-28.50A.
Irving, Barry Frederick: *See—*
Gidley, John Arthur Frederick; Irving, Barry Frederick; and Johnson, Barry Keith, 4,066,177, Cl. 214-152.000.
Isa, Hiroshi; Ukigai, Toshiyuki; Tominaga, Anri; and Sato, Michito, to Lion Fat & Oil Co., Ltd. Method for preparation of olefin oligomer. 4,066,715, Cl. 260-683.15B.
Ishida, Katsuhiko: *See—*
Yoshida, Takashi; and Ishida, Katsuhiko, 4,067,036, Cl. 357-22.000.
Ishida, Yukihito: *See—*
Sato, Ryuichi; Ishikawa, Akira; Ishida, Yukihito; Sato, Hiroshi; Tomisawa, Setsuo; Toyoshima, Shigeshi; and Ikegami, Shiro, 4,066,678, Cl. 260-429.00R.
Ishidoshiro, Hiroshi: *See—*
Sando, Yoshikazu; Ishidoshiro, Hiroshi; and Nakano, Eiichi, 4,066,541, Cl. 210-51.000.
Ishigaki, Yukinobu; and Sasamura, Kohei, to Victor Company of Japan, Ltd. System for demodulating angle-modulated signals. 4,066,972, Cl. 329-134.000.
Ishigami, Noriakira, to Aisin Seiki Kabushiki Kaisha. Brake pressure-difference warning system for vehicles. 4,066,303, Cl. 303-6.00C.
Ishiguro, Shoji: *See—*
Shimamura, Isao; Ishiguro, Shoji; and Ogawa, Junkichi, 4,066,461, Cl. 96-66.300.
Ishii, Kenji: *See—*
Tosaka, Osamu; Morioka, Hajimu; Hirakawa, Hayao; Ishii, Kenji; Kubota, Koji; and Hirose, Yoshio, 4,066,501, Cl. 195-29.000.
Ishikawa, Akira: *See—*
Sato, Ryuichi; Ishikawa, Akira; Ishida, Yukihito; Sato, Hiroshi; Tomisawa, Setsuo; Toyoshima, Shigeshi; and Ikegami, Shiro, 4,066,678, Cl. 260-429.00R.
Ishikawa, Kazuo: *See—*
Toyama, Masamichi; Takigawa, Tomoshi; Hirata, Noritsugu; and Ishikawa, Kazuo, 4,066,346, Cl. 352-72.000.

Israel, Jack D.: *See—*
Costanza, Samuel T.; Franklin, Peter G.; Gebhardt, Frank L.; Israel, Jack D.; Moore, Charles R.; and Wheatley, Charles E., III, 4,066,964, Cl. 325-55.000.

Itani, Takashi: *See—*
Takahashi, Kiyoshi; Takimoto, Hiroyuki; Yamada, Takashi; Itani, Takashi; Ashida, Akira; and Suzaki, Kuniyoshi, 4,066,963, Cl. 352-12.000.

Itek Corporation: *See—*
Ebner, Peter R., 4,067,022, Cl. 354-7.000.

Ito, Hiroshi: *See—*
Umeda, Haruhiko; Ito, Hiroshi; and Suketomo, Toshitaka, 4,066,143, Cl. 180-77.00S.

Itoh, Katsumi: *See—*
Oka, Yoshikazu; Miyake, Akio; Tada, Norio; and Itoh, Katsumi, 4,066,648, Cl. 260-268.0TR.

Itoh, Tomo; and Yanagisawa, Syozo, to Hitachi, Ltd. Pressure switching valve device. 4,066,091, Cl. 137-79.000.

ITT Industries, Incorporated: *See—*
Strohl, Klaus D., 4,066,982, Cl. 331-111.000.

Iura, Yukio: *See—*
Yoshikawa, Ryoichi; Oda, Teruhisa; Tanaka, Kunio; Iura, Yukio; Fukushima, Tadahide; and Aizawa, Hiroshi, 4,067,032, Cl. 354-288.000.

Iwanaga, Masaya, to Shimadzu Seisakusho Ltd. Scanning mass spectrometer having constant magnetic field. 4,066,895, Cl. 250-296.000.

Izumi Denki Corporation: *See—*
Fujita, Teizo; and Ohashi, Tosiro, 4,066,838, Cl. 174-48.000.

J. I. Case Company: *See—*
Alcalay, Joseph, 4,066,004, Cl. 91-183.000.
Baylor, John Merlin, 4,066,302, Cl. 305-11.000.

J. Sainsburg Limited: *See—*
Follett, Michael John, 4,066,798, Cl. 426-393.000.

J. W. Greer, Inc.: *See—*
Korstvedt, Harald Olaf, 4,066,246, Cl. 366-293.000.

Jablin, Richard. Coke quenching steam generator. 4,066,513, Cl. 201-39.000.

Jackson, Earl V., to Xerox Corporation. Velocity compensation for bead bypass. 4,066,452, Cl. 96-1.0PE.

Jackson, James D.: *See—*
Blazek, William S.; Piwonka, Thomas S.; Jackson, James D.; and Atanmo, Philip N., 4,066,116, Cl. 164-17.000.

Jackson, W. Shaun; and Bohm, Leslie Eric. Handlebar bag. 4,066,196, Cl. 224-30.00A.

Jacob, Adir, to LFE Corportion. Apparatus for depositing dielectric films using a glow discharge. 4,066,037, Cl. 118-49.100.

Jaffe, Wolfgang, to Singer Company, The. Metal detecting device with magnetically influenced Hall effect sensor. 4,066,962, Cl. 324-208.000.

Jager, Herbert Paul: *See—*
Beck, Hans Werner; and Jager, Herbert Paul, 4,066,380, Cl. 408-125.000.

Jager, Horst, to Ciba-Geigy Corporation. Method of finishing synthetic organic fibrous material, in particular of providing it with an antistatic finish. 4,066,597, Cl. 260-29.6WB.

James G. Brown & Associates, Inc.: *See—*
Dysarz, Edward David, 4,065,934, Cl. 61-87.000.

Janson, Bertil Sven: *See—*
Johnston, Gordon Boyd; Hillmann, Reinhart Michael; Kregler, Helmuth Martin; Janson, Bertil Sven; and Strandberg, Hasse Eivind, 4,066,304, Cl. 308-201.000.

Janssen Pharmaceutica N.V.: *See—*
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,066,772, Cl. 424-267.000.

Japan Atomic Energy Research Institute: *See—*
Machi, Sueo; Wada, Takeshi; and Sekiya, Hiroshi, 4,066,522, Cl. 204-159.240.
Sato, Shoichi, 4,066,741, Cl. 423-658.000.

Jaulmes, Eric, to Ateliers de la Motobecane. Anti-theft device for helmet and helmet for use with the device. 4,065,945, Cl. 70-58.000.

Jenaer Glaswerk Schott & Gen.: *See—*
Faulstich, Marga; and Geffcken, Walter, 4,066,464, Cl. 106-47.00Q.
Gunthner, Franz, 4,066,428, Cl. 65-66.000.

Jenkins, Leonard A.: *See—*
Shutie, Orin S.; and Jenkins, Leonard A., 4,066,038, Cl. 118-218.000.

Jensen, Harald: *See—*
Reuschling, Dieter-Bernd; and Jensen, Harald, 4,066,690, Cl. 260-544.00Y.

Jeumont-Schneider: *See—*
Virnot, Alain D.; and Cynober, Simon A., 4,066,877, Cl. 364-426.000.

Jirkovsky, Ivo: *See—*
Demerson, Christopher A.; Humber, Leslie G.; Santroch, George; Dobson, Thomas A.; and Jirkovsky, Ivo, 4,066,763, Cl. 424-246.000.
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,066,779, Cl. 424-274.000.
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,066,780, Cl. 424-274.000.

Jocham, Reinhold: *See—*
Heinrich, Felix; Linka, Adolf; and Jocham, Reinhold, 4,066,105, Cl. 139-54.000.

Jochum, Peter; and Seghezzi, Hans Dieter, to Hilti Aktiengesellschaft. Fastening element setting gun with an ejection member. 4,066,198, Cl. 227-8.000.

Jochum, Peter; and Seghezzi, Hans Dieter, to Hilti Aktiengesellschaft. Explosive charge feed arrangement for a setting gun. 4,066,199, Cl. 227-10.000.

Johnsen, Edward L. Continuous business form or the like adapted for subsequent processing into combination mailing envelopes and return envelopes having a common back ply panel. 4,066,251, Cl. 270-37.000.

Johnson, Alan J.; Soberano, Mercedes E.; Ong, Eng Bee; and Levy, Milton, to United States of America, Health, Education and Welfare. Method of separating and purifying two active forms of urokinase using affinity chromatography. 4,066,506, Cl. 195-66.00B.

Johnson, Barry Keith: *See—*
Gidley, John Arthur Frederick; Irving, Barry Frederick; and Johnson, Barry Keith, 4,066,177, Cl. 214-152.000.

Johnson, Christopher Linley; and Millns, Colin, to Rolls-Royce Limited. Priming systems for pumps. 4,066,386, Cl. 417-199.00A.

Johnson, David A. Revolver speed loader. 4,065,868, Cl. 42-89.000.

Johnson, Donald R.; Nadeau, Richard G.; Nieuweboer, Gerrit; and Truett, William L., to Du Pont de Nemours, E. I., and Company. Automatic clinical analyzer. 4,066,412, Cl. 23-253.00R.

Johnson, Edmond L. Vehicle body part holding and positioning device. 4,066,243, Cl. 254-133.00R.

Johnson, Edwin G.: *See—*
Mogavero, Louis N.; Johnson, Edwin G.; Evans, John M., Jr; and Albus, James S., 4,067,015, Cl. 343-225.000.

Johnson, Edwin Lee: *See—*
Peniston, Quintin P.; and Johnson, Edwin Lee, 4,066,735, Cl. 423-159.000.

Johnson, J. Ralph. Method of and apparatus for the tape loading and use of a single turntable in the rendition of a taped program. 4,066,221, Cl. 242-55.19A.

Johnson & Johnson: *See—*
Berg, Jeffrey, 4,066,078, Cl. 128-2.06E.
Vaillancourt, Vincent Louis, 4,066,556, Cl. 210-448.000.

Johnson, Joseph M., to Boeing Company, The; and Aeritalia S.p.A. Gas turbine exhaust nozzle for controlled temperature flow across adjoining airfoils. 4,066,214, Cl. 239-265.190.

Johnson, Lowell W.: *See—*
Hoyer, William A.; Johnson, Lowell W.; and Schoenenberger, Richard J., 4,066,801, Cl. 427-8.000.

Johnson, Steven H.: *See—*
Taenzer, Jon C.; and Johnson, Steven H., 4,065,976, Cl. 73-633.000.

Johnston, Gordon Boyd; Hillmann, Reinhart Michael; Kregler, Helmuth Martin; Janson, Bertil Sven; and Strandberg, Hasse Eivind, to SKF Industrial Trading and Development Company B.V. Bearing cage. 4,066,304, Cl. 308-201.000.

Johnston, Howard; and Senkbeil, Herman O., to Dow Chemical Company, The. Substituted aminodi- or trihalopyridines and method of use. 4,066,438, Cl. 71-94.000.

Johnston, James D.; Sanders, Robert N.; and Wood, James M., Jr., to Ethyl Corporation. Process for producing magnesium utilizing aluminum metal reductant. 4,066,445, Cl. 75-67.00R.

Jonas, Heinz: *See—*
Bockelmann, Wolfgang; Nieder-Vahrenholz, Hans-Georg; Niederprum, Hans; and Jonas, Heinz, 4,066,734, Cl. 423-61.000.

Jones, Charles; and Loyd, Robert William, Jr., to Curtiss-Wright Corporation. Rotary engine with tongue and groove inserts in rotor faces. 4,066,044, Cl. 123-8.090.

Jones, David: *See—*
Fray, Adrian Forrest; and Jones, David, 4,066,334, Cl. 350-160.0LC.

Jones, Eric Mynard, to Karl Storz Endoscopy-America, Inc. Coupler for joining optical devices. 4,066,330, Cl. 350-80.000.

Jones, Ivor Wynn; Robinson, Graham; and Bird, Thomas Lewis, to Electricity Council, The. Sodium sulphur cells. 4,066,826, Cl. 429-104.000.

Jones, John W. D.; and Oakey, Keith R., to Smiths Industries Limited. Servo systems. 4,066,946, Cl. 318-685.000.

Jones, Kenneth Wilson: *See—*
Shiel, Leslie Edward; and Jones, Kenneth Wilson, 4,066,469, Cl. 106-89.000.

Jones, Norman A. Theft resistant receptacle. 4,066,208, Cl. 232-1.00C.

Jones, Reuben G.; and Terando, Norman H., to Eli Lilly and Company. Anti-bacterial compositions containing certain 3-nitropyrazoles. 4,066,776, Cl. 424-270.000.

Jones, Richard Henry: *See—*
Olson, Larry Lee; and Jones, Richard Henry, 4,066,548, Cl. 210-160.000.

Jones, Robert Alexander. Flying saucer toy. 4,065,873, Cl. 46-75.000.

Jones, Thomas M., to Tennessee Valley Authority. Production of suspension fertilizers from wet-process orthophosphoric acids. 4,066,432, Cl. 71-34.000.

Jonsson, Kjartan A., to Sun-Econ, Inc. Air-conditioning apparatus with booster heat exchanger. 4,065,938, Cl. 62-160.000.

Jonsson, Nils Ake; Merenyi, Ferenc; and Westlund, Lars-Erik, to AB Kabi. Chromogen-reactive-indicator preparations containing A 3,3'-di(carbonyloxy- or sulfonyloxy-group-containing) benzidine derivative chromogen. 4,066,408, Cl. 23-230.00R.

Jorgensen-Beck, Frode; and Lambach, Heinrich Wilhelm, to Brdr. Schur International A/S, J. W. Schursevej. Dispenser carton boxes. 4,066,207, Cl. 229-17.0SC.

Joseph, Joseph Peter: *See—*
Nair, Vijay Gopalan; Joseph, Joseph Peter; and Bernstein, Seymour, 4,066,829, Cl. 536-103.000.

Jossel, Franklin: *See*—
Mammino, Joseph; and Jossel, Franklin, 4,066,563, Cl. 252-62.10P.
Joyes, John Frank, to Lucas Industries Limited. Control circuits for electrically driven vehicles. 4,066,939, Cl. 318-251.000.
Juhasz, John Emil, to Rockwell International Corporation. Monitoring and recording system for vehicles. 4,067,061, Cl. 364-900.000.
Junge, Peter; Schulz, Horst; Schneider, Rainer; Dreke, Werner; and Rieger, Gerhard, to KEPEC Chemische Fabrik GmbH. Leather dressing composition of an aqueous emulsion of solvent solutions of substituted celluloses and polyurethanes. 4,066,818, Cl. 428-341.000.
Jungpeter, Raymond R.; and Buchholz, Jean L., to Du Pont de Nemours, E. I., and Company. Tenter frame clip-opening wheel with resilient rim. 4,065,838, Cl. 26-94.000.
Jutus, Marvin W.: *See*—
Skinner, David R.; Jutus, Marvin W.; and Sowell, Miles L., 4,066,123, Cl. 166-68.500.
Juvinall, John W., to Owens-Illinois, Inc. Apparatus and method for inspecting glass containers. 4,066,363, Cl. 356-198.000.
Kabas, Guglielmo: *See*—
Kormany, Geza; and Kabas, Guglielmo, 4,066,830, Cl. 542-456.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Nishijima, Komio; and Kojima, Masakazu, 4,066,001, Cl. 90-3.000.
Umeda, Haruhiko; Ito, Hiroshi; and Suketomo, Toshitaka, 4,066,143, Cl. 180-77.00S.
Kabushiki Kaisha Ricoh: *See*—
Hashimoto, Mitsuru, 4,066,454, Cl. 96-1.50R.
Kabushiki Kaisha Toyota Cho Kenkyusho: *See*—
Takeuchi, Masaharu; Igarashi, Isemi; and Bunda, Tsuchio, 4,066,450, Cl. 75-229.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Kamigaito, Osami; and Oyama, Yoichi, 4,066,468, Cl. 106-73.400.
Kaczmarek, Leo W.: *See*—
Piper, Jack Richard; and Kaczmarek, Leo W., 4,066,858, Cl. 200-84.00C.
Kadija, Igor V.; and Ahn, Byung K., to Olin Corporation. Cell and process for electrolyzing aqueous solutions using a porous metal separator. 4,066,519, Cl. 204-98.000.
Kadin, Saul B., to Pfizer Inc. 1-Oxo-6-substituted pyrimido [1,2-a]quinoline-2-carboxylic acids and derivatives thereof and their use as antiallergy agents. 4,066,766, Cl. 424-251.000.
Kagata, Akira, to Matsushita Electric Industrial Co., Ltd. Knife-edge bearing system. 4,066,267, Cl. 274-23.00R.
Kainmuller, Thomas: *See*—
Herzog, Hans; Buxbaum, Lothar; Kainmuller, Thomas; and Habermeier, Jurgen, 4,066,626, Cl. 260-75.00N.
Kaiser, Joachim: *See*—
Kunstmann, Rudolf; and Kaiser, Joachim, 4,066,764, Cl. 424-248.540.
Kaken Chemical Co., Ltd.: *See*—
Shibuya, Hajime; and Shirato, Shiroh, 4,066,781, Cl. 424-283.000.
Kalmovicz, Rudolf: *See*—
Burger, Manfred R.; Gagel, Ernst; Kalmovicz, Rudolf; and Prechtl, Alfred, 4,065,937, Cl. 62-89.000.
Kaloi, Cyril M., to United States of America, Navy. Dual notched/diagonally fed electric microstrip dipole antennas. 4,067,016, Cl. 343-700.0MS.
Kameda, Hiromi; and Inagaki, Sanji, to Minolta Camera Kabushiki Kaisha. Electroconductive elastic spone member and electrostatic image transfer mechanism. 4,066,352, Cl. 355-3.0TE.
Kametani, Yoshiya: *See*—
Mimura, Koji; Kawai, Atsushi; Kametani, Yoshiya; and Nakahama, Tetsuro, 4,066,730, Cl. 264-191.000.
Kamigaito, Osami; and Oyama, Yoichi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Ceramics of silicon nitride. 4,066,468, Cl. 106-73.400.
Kamp, Arthur J.; and Mischler, Philip G., to Dow Chemical Company, The. Method and apparatus for monitoring amount of a substance applied to a fabric. 4,066,898, Cl. 250-359.000.
Kamp, Heinz, to W. Schlafhorst & Co. Method and device for supplying empty conical coil cores to the individual winding stations of a textile machine. 4,066,218, Cl. 242-35.50A.
Kanda, Hiroshi; Wang, Hwa L.; and Hesseltine, Clifford W., to United States of America, Agriculture. Method of producing soybean milk yoghurt. 4,066,792, Cl. 426-41.000.
Kantner, Otto: *See*—
Freudenschuss, Otto; Kantner, Otto; and Revy von Belvard, Peter, 4,066,345, Cl. 352-27.000.
Kapaun, Gustav: *See*—
Fuchs, Hermann; Kapaun, Gustav; and Meininger, Fritz, 4,066,638, Cl. 260-196.000.
Kaptanis, Panoyotis, to Stabilus GmbH. Pneumatic spring of adjustable length. 4,066,279, Cl. 280-711.000.
Karino, Takafumi: *See*—
Sakamoto, Masakatsu; Watanabe, Syosaku; Karino, Takafumi; Yazu, Junichi; Takashima, Kouichi; Miyashiro, Hiroshi; Takagi, Takeo; and Konno, Takao, 4,066,298, Cl. 302-2.00R.
Karl Lautenschlager KG., Mobelbeschlagfabrik: *See*—
Lautenschlager, Karl, 4,065,829, Cl. 16-145.000.
Karl Storz Endoscopy-America, Inc.: *See*—
Jones, Eric Mynard, 4,066,330, Cl. 350-80.000.
Karns, Ed, III. Hydraulic post hole auger apparatus. 4,066,134, Cl. 173-27.000.
Karp, Alexander; and Boron, Alfred. Packaging machine and method for chitterlings. 4,066,107, Cl. 141-11.000.
Karp, Arthur, to Stanford Research Institute. Electromagnetic resonators having slot-located switches for tuning to different frequencies. 4,066,988, Cl. 333-82.00B.
Karp, Robert S.; and Flint, John R., to Bell & Howell Company. Information retrieval system with expanded logic capability. 4,066,872, Cl. 353-26.00A.
Kasama, Tsuneo; Wada, Makoto; Sano, Masakatu; and Tsuji, Shinzo, to Nippon Oil and Fats Co., Ltd. Gas generator for inflatable life raft. 4,066,415, Cl. 23-281.000.
Katagiri, Masayoshi: *See*—
Ohmi, Atsushi; and Katagiri, Masayoshi, 4,066,997, Cl. 340-59.000.
Katayama, Ichiro, to Takenaka Komuten Company, Ltd. Method of reforming the ground. 4,065,933, Cl. 61-50.000.
Katayama, Sunao: *See*—
Hattori, Shuzo; Hiramatsu, Tadao; Katayama, Sunao; Ozawa, Hidenori; and Hiraiwa, Yasuyuki, 4,066,338, Cl. 350-161.00W.
Kato, Hisatoyo; and Miyahara, Junji, to Fuji Photo Film Co., Ltd. Rear projection screens. 4,066,332, Cl. 350-126.000.
Kaupin, William B., to William Carter Company, The. Fire retardant polyester textile materials and method of making same. 4,066,812, Cl. 428-265.000.
Kawada, Hiroitsu: *See*—
Okazaki, Kiyoshi; Kawada, Hiroitsu; Shimizu, Hidemi; Ohmura, Tadayoshi; and Sekino, Jun, 4,066,787, Cl. 424-317.000.
Kawada, Seigo; and Hayashi, Shigeru, to Kumiai Chemical Industries Ltd. Agricultural and horticultural fungicidal compositions. 4,066,760, Cl. 424-245.000.
Kawai, Atsushi: *See*—
Mimura, Koji; Kawai, Atsushi; Kametani, Yoshiya; and Nakahama, Tetsuro, 4,066,730, Cl. 264-191.000.
Kawame, Yasuta: *See*—
Naito, Hirokuni; Yoshimura, Isao; Takao, Norito; and Kawame, Yasuta, 4,066,811, Cl. 428-220.000.
Kawamura, Tateo: *See*—
Takagi, Atsushi; Kuroiwa, Hiroyuki; Miyaguchi, Masao; and Kawamura, Tateo, 4,065,928, Cl. 61-36.00R.
Kawasaki, Hiroshi, to Sharp Kabushiki Kaisha. Pushbutton switch key arrangement for keyboards having indicia. 4,066,860, Cl. 200-308.000.
Kawasaki, Masahiro: *See*—
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; Mita, Kunio; Kawasaki, Masahiro; and Mori, Chiharu, 4,067,023, Cl. 354-23.00D.
Kawase, Shoji; Kuratsuji, Takatoshi; Inata, Hiroo; Suzuki, Kazuyoshi; and Shima, Takeo, to Teijin Limited. Polyesters of naphthalene carboxylic acids and hydroxy alkoxydiphenyl sulfones. 4,066,624, Cl. 260-49.000.
Kearney & Trecker Corporation: *See*—
Lohneis, Earl R.; and Schachte, John J., 4,065,988, Cl. 82-2.700.
Keebler Company: *See*—
Hanna, Ward T.; Drennan, John J.; and Staroska, John T., 4,066,167, Cl. 206-627.000.
Keiller, Clifton Quinton: *See*—
Balas, Salman Heskel; and Keiller, Clifton Quinton, 4,066,263, Cl. 273-273.000.
Kejnovsky, Bohumil; and Kopecny, Miroslav, to ELITEX, Zavody textilniho strojirenstvi generalni reditelstvi. Panties or the like and method of manufacturing same. 4,065,942, Cl. 66-177.000.
Keller, Karlheinz: *See*—
Soiron, Charles; and Keller, Karlheinz, 4,066,395, Cl. 8-169.000.
Keller, Martin. Protective guard and method for forming and applying. 4,066,074, Cl. 128-89.00R.
Kelley, Albert W. Container system for plant husbandry. 4,065,877, Cl. 47-85.000.
Kelly, Joseph D.; Cohen, Emory M.; Henley, Barry K.; Holt, Hammond H.; and Agalsoff, John, to Glen Glenn Sound. Sound editing system. 4,067,049, Cl. 360-14.000.
Kelly, Roger Sidney Arthur; and Wilson, John Robert, to Imperial Chemical Industries Limited. Processes for coating films. 4,066,820, Cl. 428-483.000.
Kelsey, John A.: *See*—
Bierenfeld, Herbert H.; McGonigal, Charles; Horton, Chauncey M., Jr.; and Kelsey, John A., 4,066,317, Cl. 339-91.00R.
Kemp, Willard E.: *See*—
Atkinson, Eulas R.; and Kemp, Willard E., 4,066,240, Cl. 251-175.000.
Kennis, Ludo E. J.: *See*—
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,066,772, Cl. 424-267.000.
Keogh, Raymond J.: *See*—
Burr, Robert Page; Morino, Ronald; and Keogh, Raymond J., 4,065,850, Cl. 29-625.000.
KEPEC Chemische Fabrik GmbH: *See*—
Junge, Peter; Schulz, Horst; Schneider, Rainer; Dreke, Werner; and Rieger, Gerhard, 4,066,818, Cl. 428-341.000.
Kerstens, Franciscus Napoleon Adrianus: *See*—
Van Besouw, Joannes Baptista Maria Adrianus; Gotje, Egbert Bernardus Gretinus Willem; and Kerstens, Franciscus Napoleon Adrianus, 4,066,928, Cl. 315-39.510.
Key, Walter W.; and Coggins, Eugene L., to Paoli High Fidelity Consultants, Inc. Audio amplifier with improved stability. 4,066,975, Cl. 330-81.000.
Keystone International, Inc.: *See*—
Killian, Henry R., 4,065,979, Cl. 74-89.150.
Kidd, Wayne L., to Xerox Corporation. Variable illumination optical system. 4,066,351, Cl. 355-3.00R.
Kierstead, Richard Wightman: *See*—
Cohen, Michael Robert; Kierstead, Richard Wightman; and Tilley, Jefferson Wright, 4,066,695, Cl. 260-564.00E.

Kikukawa, Yoshiiku: *See*—
Kuramoto, Yoshio; Imura, Toshinori; and Kikukawa, Yoshiiku, 4,067,030, Cl. 354-139.000.
Kikumoto, Ryoji: *See*—
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tonomura, Shinji; Tamao, Yoshikuni; Tezuka, Tohru; and Hijikata, Akiko, 4,066,758, Cl. 424-244.000.
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Kilgren, Arnold William; Low, David Nicholson; and Porter, Robert Warwick, to Du Pont de Nemours, E. I., and Company. Selectively recovering metal chlorides from gaseous effluent. 4,066,424, Cl. 55-71.000.
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Harrington, James Nelson, 4,066,036, Cl. 116-114.00R.
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Strauss, Werner, 4,066,535, Cl. 209-139.00A.
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Romovacek, George R., 4,066,159, Cl. 196-132.000.
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Kramer, Bruce M.: *See*—
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Krepler, Albert: *See*—
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Krueger, Hans: *See*—
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Kummer, Franz; Mai, Gerhard; Ruthardt, Rolf; and Thiede, Horst, to W. C. Heraeus GmbH. Method of making metallic support carrier for semiconductor elements. 4,065,851, Cl. 29-630.00R.
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Wolf, Gerhard Dieter; Miessen, Ralf; Kunzel, Hans Egon; and Bentz, Francis, 4,066,396, Cl. 8-178.00A.
Kuper, Donald G.: *See*—
Anderson, Kenneth L.; and Kuper, Donald G., 4,066,632, Cl. 260-79.100.
Kuramoto, Yoshio; Imura, Toshinori; and Kikukawa, Yoshiiku, to Minolta Camera Kabushiki Kaisha. Camera focussing aid. 4,067,030, Cl. 354-139.000.
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Kwiatkowski, Wolfgang, to AGFA-Gevaert, AG. Photographic developing machine 4,067,034, Cl. 354-310.000.
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Armstrong, Nelson W., 4,066,183, Cl. 215-247.000.
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Labes, Mortimer M., to Temple University. Liquid crystal cumulative dosimeter. 4,066,567, Cl. 252-299.000.
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Pungor, Erno; and Varadi, Maria, 4,066,406, Cl. 23-230.00R.
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LaCapria, Anthony, to American Bank Note Company. Documents of value printed to prevent counterfeiting. 4,066,280, Cl. 283-8.00R.
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Lauster, Frederick L., 4,066,566, Cl. 252-136.000.
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Skoglund, Klas Axel Lennart; and Backgard, Stig Gunnar Bengt, 4,066,013, Cl. 100-53.000.
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Lancaster, Alfred John. Hingeing attachment. 4,065,828, Cl. 16-128.00R.
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Pickard, Keith John, 4,066,493, Cl. 162-158.000.
Larsson, Kim. Automatic baster. 4,066,010, Cl. 99-346.000.
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Lau, Erwin M., to Black Products Company. Valve bag filler, handling and sealing system. 4,066,108, Cl. 141-68.000.
Lauster, Frederick L., to Lafant Research Company. Denture cleaner. 4,066,566, Cl. 252-136.000.
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Swift, David Merton, 4,066,910, Cl. 250-555.000.
Lawrence, Walter W., Jr.; McKay, Tom W.; and Wiegand, Karl E., to Ethyl Corporation. Chemical process. 4,066,688, Cl. 260-535.00P.
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Huang, Yueh, 4,066,170, Cl. 211-63.000.
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Pfarrer, David M.; and Van Essen, Leonard J., 4,066,937, Cl. 318-221.00G.

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Liebscher, Gunther; and Christ, Gunther, 4,066,151, Cl. 188-5.000.

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Lieser, Martin J.; and Lieser, Donna Jean, 4,065,844, Cl. 29-258.000.

Lieser, Martin J.; and Lieser, Donna Jean. Bearing puller for washing machines. 4,065,844, Cl. 29-258.000.

Lietard, Jean-Marie; and Matthijs, Guido, to U C B, Societe Anonyme. Continuous process for producing an aqueous solution of ferric chloride. 4,066,748, Cl. 424-147.000.

Liggett, Thomas, to United States of America, Navy. Process for producing concentrated solutions of hydroxylammonium nitrate and hydroxylammonium perchlorate. 4,066,736, Cl. 423-386.000.

Lignos, James M.: *See—*
Sury, Yel S.; and Lignos, James M., 4,066,642, Cl. 260-251.00P.

Lim, Gary M. F.: *See—*
Menard, Marcel; Lim, Gary M. F.; and Conway, Terry T., 4,066,832, Cl. 544-105.000.

Lim, Hong Sup, to Hughes Aircraft Company. Dopants for dynamic scattering liquid crystals. 4,066,569, Cl. 252-299.000.

Lind, Charles F., Jr., to Aqueduct, Inc. Flow-control valve. 4,066,096, Cl. 137-504.000.

Lind, Erwin; and Freimuth, Franz, to Hoechst Aktiengesellschaft. Process for the preparation of printing forms. 4,066,453, Cl. 96-1.00R.

Lind, Hanns, to Ciba-Geigy Corporation. Hydroxyaryl hydantoins and their use as stabilizers. 4,066,616, Cl. 260-45.8NT.

Lindal, Sir Walter. Sheetmetal covered roof planks having waterproof joints. 4,065,902, Cl. 52-622.000.

Lindner, Henry, to Beatrice Foods Co. Cube corner type retroreflector bodies and molds made therewith. 4,066,236, Cl. 249-160.000.

Lindner, Henry, to Beatrice Foods Co. Cube corner type retroreflectors with improved cube corner unit relationships. 4,066,331, Cl. 350-103.000.

Lindsay, James R.: *See—*
Lakin, Michael B.; and Lindsay, James R., 4,066,382, Cl. 416-186.00A.

Linka, Adolf: *See—*
Heinrich, Felix; Linka, Adolf; and Jocham, Reinhold, 4,066,105, Cl. 139-54.000.

Linne, Terry D., to Caterpillar Tractor Co. Dual-material self-bonding lip seal. 4,066,269, Cl. 277-228.000.

Linton, John D.; Willits, Samuel P.; and Mohan, William L., to Spartanics, Ltd. Weapon training simulator. 4,065,860, Cl. 35-25.000.

Lion Fat & Oil Co., Ltd.: *See—*
Isa, Hiroshi; Ukigai, Toshiyuki; Tominaga, Anri; and Sato, Michito, 4,066,715, Cl. 260-683.15B.

Livingston, Almer K. Apparatus for collecting objects from a surface. 4,066,179, Cl. 214-356.000.

Lo-Rise Elevator Company: *See—*
Brown, Richard L., 4,066,148, Cl. 187-17.000.

Lodge & Shipley Company, The: *See—*
Rowekamp, Edward F., 4,066,163, Cl. 198-442.000.

Loeffler, Herbert H., to Woodstream Corporation. Low impact animal trap. 4,065,871, Cl. 43-88.000.

Lohneis, Earl R.; and Schachte, John J., to Kearney & Trecker Corporation. Unitary work changer for a machining center. 4,065,988, Cl. 82-2.700.

Lohr, Raymond J. Toy vehicle. 4,066,271, Cl. 280-1.182.

Lohr, Raymond J. Toy car. 4,066,273, Cl. 280-211.000.

Long, Robert B.; Caruso, Fred A.; DeFeo, Richard J.; and Walker, David G., to Exxon Research & Engineering Co. Bimetallic salts and derivatives thereof, their preparation and use in the complexing of ligands. 4,066,679, Cl. 260-438.100.

Lopez, Alfred R.: *See—*
Wheeler, Harold A.; and Lopez, Alfred R., 4,067,014, Cl. 343-113.0DE.

Lorenz, Hans-Peter: *See—*
Kobale, Manfred; Krueger, Hans; and Lorenz, Hans-Peter, 4,066,337, Cl. 350-160.0LC.

Lorenzen, James Walter; and Schaefer, Bruce John. Hydrostatically activated release mechanism. 4,065,823, Cl. 9-9.000.

Lovendusky, Charles Michael, to Du Pont de Nemours, E. I., and Company. Circuit board contact. 4,066,326, Cl. 339-221.00M.

Low, David Nicholson: *See—*
Kilgren, Arnold William; Low, David Nicholson; and Porter, Robert Warwick, 4,066,424, Cl. 55-71.000.

Loyd, Robert William, Jr.: *See—*
Jones, Charles; and Loyd, Robert William, Jr., 4,066,044, Cl. 123-8.090.

Loynes, Leslie M.; Walters, Darrel H.; and Penick, Clarence A., Jr., to Brammall, Inc. Tamper proof attachment system. 4,065,946, Cl. 70-58.000.

Lucas Electrical Company Limited, The: *See—*
Martin, Frederick Raymond Patrick, 4,066,886, Cl. 362-68.000.

Lucas Industries Limited: *See—*
Joyes, John Frank, 4,066,939, Cl. 318-251.000.

Lucas, James P.: *See—*
Mastalski, Henry N.; Lucas, James P.; Dziedzic, Edward; and Eppinger, David P., 4,066,368, Cl. 403-211.000.

Luh, Bing Yu: *See—*
Belleau, Bernard R.; Doyle, Terrence W.; Luh, Bing Yu; and Conway, Terry T., 4,066,831, Cl. 544-105.000.

Lundbald, Leif Jorgen I.; and Ek, Jan Olof, to Inter Innovation AB. Apparatus for dispensing banknotes, tickets or the like. 4,066,253, Cl. 271-4.000.

Lunts, Lawrence Henry Charles; and Collin, David Trevor, to Allen & Hanburys Limited. Phenylaminoethanol derivatives for treating hypertension. 4,066,755, Cl. 424-230.000.

Lupica, Vincent. Body fluid testing system and process. 4,066,407, Cl. 23-230.00B.

Lutz, Albert William; and Diehl, Robert Eugene, to American Cyanamid Company. Preemergence herbicidal methods and compositions using 2,6-dinitroxylidine compounds. 4,066,441, Cl. 71-121.000.

Lynch, Bobby Ross: *See—*
Collins, Johnny Will; Kochmanis, Gunars; and Lynch, Bobby Ross, 4,066,174, Cl. 214-7.000.

Lynch, Henry Wilfred: *See—*
Finney, Roy P.; and Lynch, Henry Wilfred, 4,066,073, Cl. 128-79.000.

Lyu, Seung W., to National Can Corporation. Split punch for drawing and ironing containers. 4,065,951, Cl. 72-349.000.

Machi, Sueo; Wada, Takeshi; and Sekiya, Hiroshi, to Japan Atomic Energy Research Institute. Process for the production of high molecular weight acrylamide polymers. 4,066,522, Cl. 204-159.240.

Machida, Takayasu: *See—*
Nakajima, Fumio; Machida, Takayasu; and Yamada, Kenji, 4,066,947, Cl. 318-696.000.

Macur, George Joseph: *See—*
Alpaugh, Warren Alan; Macur, George Joseph; and Vlasak, Gary Paul, 4,066,809, Cl. 427-444.000.

Maeda, Nobutaka: *See*—
Tsukamoto, Hidehiko; and Maeda, Nobutaka, 4,065,948, Cl. 72-108.000.
Maeda, Takesi; Kohmoto, Mahito; and Yonezawa, Seiji, to Hitachi, Ltd. Information recording and retrieval apparatus. 4,067,044, Cl. 358-128.000.
Maher, Galeb H., to Sprague Electric Company. Method of forming a glass-reacted-ceramic with cadmium. 4,066,426, Cl. 65-18.000.
Mai, Gerhard: *See*—
Kummer, Franz; Mai, Gerhard; Ruthardt, Rolf; and Thiede, Horst, 4,065,851, Cl. 29-630.00R.
Mains, Harold E.; Williams, Frederick R.; and O'Brien, William L., to Emery Industries, Inc. Thermoplastic polyester compositions containing polyamide additives. 4,066,587, Cl. 260-22.00D.
Mak, Sze Hong. Model track section. 4,066,211, Cl. 238-10.00F.
Malefant, Jean-Yves: *See*—
Saleil, Jean; Debras, Maurice; and Malefant, Jean-Yves, 4,066,442, Cl. 75-12.000.
Mallams, Alan K.; and Davies, David Huw, to Schering Corporation. 1-Desamino-1-hydroxy and 1-desamino-1-epi-hydroxy-4,6-di-o-(aminoglycosyl)-1,3-diaminocyclitols; 1-desamino-1-oxo-4,6-di-o-(aminoglycosyl)-1,3-diaminocyclitols, intermediates and use as antibacterial agents. 4,066,752, Cl. 424-180.000.
Mallinckrodt, Inc.: *See*—
Kneller, Mills T., 4,066,743, Cl. 424-5.000.
Malobabic, Peter: *See*—
Buzzi, Leo; and Malobabic, Peter, 4,065,977, Cl. 74-49.000.
Mammino, Joseph; and Jossel, Franklin, to Xerox Corporation. Copper-tetra-4-(octadecylsulfonomido) phthalocyanine electrophotographic carrier. 4,066,563, Cl. 252-62.10P.
Manasevit, Harold M.; and Simpson, William I., to Rockwell International Corporation. Metalorganic chemical vapor deposition of IVA–IVA compounds and composite. 4,066,481, Cl. 148-174.000.
Mann, John: *See*—
Orr, Thomas Samuel Campbell; Hall, David Edward; and Mann, John, 4,066,756, Cl. 424-232.000.
Mannesmann Aktiengesellschaft: *See*—
Dorr, Wolfgang; and Matzner, Hartwig, 4,066,114, Cl. 164-4.000.
Frentzen, Hermann Josef; Gerretz, Richard; and Henn, Ewald, 4,065,953, Cl. 72-393.000.
Grabendorfer, Werner; Vogt, Herbert; Haacke, Harri; Kuhn, Harry; Pawelletz, Reinhard; and Ries, Karl, 4,065,960, Cl. 73-627.000.
Manning, Michael L.; Anglin, Thurman L.; and Grayson, Richard F. Electric load distributor. 4,066,913, Cl. 307-38.000.
Mansfield, John Rickard, to Imperial Chemical Industries Limited. Analytical apparatus. 4,066,528, Cl. 204-195.00T.
Mantell, Gerald J.: *See*—
Dixon, Dale D.; Ford, Michael E.; and Mantell, Gerald J., 4,066,630, Cl. 260-77.50D.
Marchal, Paul: *See*—
Bourdois, Claude; Glachet, Charles; Marchal, Paul; and Vertut, Jean, 4,066,909, Cl. 250-497.000.
Marforio, Nerino, to Rockwell-Rimoldi S.p.A. Workpiece feeder device for the traveling gripper of a sewing unit. 4,066,027, Cl. 112-121.150.
Mark, Victor, to General Electric Company. Flame retardant polycarbonate composition. 4,066,618, Cl. 260-45.85T.
Marston, Peter G.; and Nolan, John J., to Sala Magnetics, Inc. Pressure support for limiting strain in a superconducting winding. 4,066,991, Cl. 335-216.000.
Martin, Eugene R.: *See*—
Lewis, Richard N.; and Martin, Eugene R., 4,066,680, Cl. 260-448.20E.
Martin, Frederick Raymond Patrick, to Lucas Electrical Company Limited, The. Motor vehicle with headlamp tilting mechanism. 4,066,886, Cl. 362-68.000.
Martin, Hans. Ski brake. 4,066,275, Cl. 280-605.000.
Martin Paint & Chemical Corporation: *See*—
Stern, David, 4,066,596, Cl. 260-29.60R.
Martos, Placido: *See*—
Perry, Robert A.; and Martos, Placido, 4,066,033, Cl. 116-34.00R.
Maruishi Cycle Industries, Ltd.: *See*—
Mimura, Yasuo, 4,065,983, Cl. 74-625.000.
Maruyama, Hiromasa: *See*—
Asai, Soichiro; Matsuishi, Tsutomu; Matsushita, Katsunobu; Ikeda, Shigeho; Kobayashi, Kaetsu; and Maruyama, Hiromasa, 4,066,502, Cl. 195-47.000.
Masashi, Uchida: *See*—
Toyoaki, Ueno; Seizo, Takayama; Kiyoshi, Hashimoto; and Masashi, Uchida, 4,066,189, Cl. 222-334.000.
Massa, Donald P.: *See*—
Massa, Frank, 4,066,095, Cl. 137-486.000.
Massa, Frank, to Dellorfano, Fred M., Jr.; and Massa, Donald P., trustees of The Stoneleigh Trust. Automatic leakage detection system for pipelines carrying fluids. 4,066,095, Cl. 137-486.000.
Massachusetts Institute of Technology: *See*—
Cook, Nathan Henry; and Kramer, Bruce M., 4,066,821, Cl. 428-539.000.
Greiff, Paul, 4,067,037, Cl. 357-34.000.
Thilly, William G., 4,066,510, Cl. 195-103.50R.
Massey-Ferguson Services N.V.: *See*—
Quick, Donald J., 4,065,912, Cl. 56-13.900.
Mastalski, Henry N.; Lucas, James P.; Dziedzic, Edward; and Eppinger, David P., to A. B. Chance Company. Helical rod deadend having segmented rod receiving connector. 4,066,368, Cl. 403-211.000.
Masuda, Hajime: *See*—
Takeuchi, Takeshi; and Masuda, Hajime, 4,066,966, Cl. 325-308.000.
Mataraza, George A.: *See*—
Farukhi, Mohammad R.; Mataraza, George A.; and Wimer, Oley D., 4,066,908, Cl. 250-483.000.
Matcote Company, Inc.: *See*—
Beers, Ronald W.; and Lakritz, Julian, 4,066,598, Cl. 260-29.70S.
Matsubara, Shigeo, to Kohkoku U.S.A., Inc. Method for collecting industrial vapors and particulate matter. 4,066,724, Cl. 264-39.000.
Matsui, Katsuaki: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou, 4,066,615, Cl. 260-45.8NT.
Matsuishi, Tsutomu: *See*—
Asai, Soichiro; Matsuishi, Tsutomu; Matsushita, Katsunobu; Ikeda, Shigeho; Kobayashi, Kaetsu; and Maruyama, Hiromasa, 4,066,502, Cl. 195-47.000.
Matsumoto, Masafumi: *See*—
Takano, Katsuyoshi; Matsumoto, Masafumi; and Orikasa, Kimihiko, 4,066,986, Cl. 333-72.000.
Matsunaga, Yoshiaki: *See*—
Wada, Shinji; Matsunaga, Yoshiaki; and Noda, Michihiro, 4,066,540, Cl. 210-44.000.
Matsushima, Noriaki: *See*—
Funabiki, Kyohei; Matsushima, Noriaki; Tachikawa, Toshiyuki; and Ikeda, Kazuichi, 4,066,588, Cl. 260-22.0TN.
Matsushita Electric Industrial Co., Ltd.: *See*—
Kagata, Akira, 4,066,267, Cl. 274-23.00R.
Nakamura, Yuji, 4,067,051, Cl. 360-95.000.
Matsushita Electronics Corporation: *See*—
Nakatani, Hirokuni; Takamura, Toru; Hiroshima, Yoshimitsu; and Hashimoto, Susumu, 4,067,046, Cl. 358-213.000.
Matsushita, Katsunobu: *See*—
Asai, Soichiro; Matsuishi, Tsutomu; Matsushita, Katsunobu; Ikeda, Shigeho; Kobayashi, Kaetsu; and Maruyama, Hiromasa, 4,066,502, Cl. 195-47.000.
Matsushita, Yasuo: *See*—
Shimazoe, Michitaka; Nakamura, Kousuke; Matsushita, Yasuo; Shimada, Satoshi; Yamada, Kazuji; and Takahashi, Yukio, 4,065,971, Cl. 73-727.000.
Matthews, Hugh B., to Sperry Rand Corporation. Acoustic isolation for a telemetry system on a drill string. 4,066,995, Cl. 340-18.0LD.
Matthijs, Guido: *See*—
Lietard, Jean-Marie; and Matthijs, Guido, 4,066,748, Cl. 424-147.000.
Matzner, Hartwig: *See*—
Dorr, Wolfgang; and Matzner, Hartwig, 4,066,114, Cl. 164-4.000.
Maw, Philip Arthur, to Molins Limited. Sharpener for cut-off having a helical knife. 4,065,880, Cl. 51-247.000.
Mayer & Cie: *See*—
Heinrich, Felix; Linka, Adolf; and Jocham, Reinhold, 4,066,105, Cl. 139-54.000.
Mayer, Edward A.; and Nolting, Jerry L., to Texaco Inc. Fuel injection nozzle valve and ignition system. 4,066,059, Cl. 123-32.0SA.
Mazelsky, Bernard, to ARA, Incorporated. Variable energy absorbing system. 4,066,149, Cl. 188-1.00C.
Mazier, Paul. Compensatory expansion bellows and its production. 4,065,947, Cl. 72-59.000.
McAlister, Roy E. Method and apparatus for fuel injection-spark ignition system for an internal combustion engine. 4,066,046, Cl. 123-32.0ST.
McAllan, Alexander Baxter: *See*—
Smith, Roy Henry; and McAllan, Alexander Baxter, 4,066,750, Cl. 424-180.000.
McBride, La Vaughn R.; Clark, Jack D.; and Center, Dale. Composition for rehabilitating scored and marred surfaces. 4,066,605, Cl. 260-37.0EP.
McCarthy, Justin P.: *See*—
Mores, Lee R.; McCarthy, Justin P.; and Slack, James J., 4,066,789, Cl. 424-365.000.
McCoy, Drew E., to Texaco Inc. Continuous process for non-catalytic oxidation of sulfite-containing waters. 4,066,543, Cl. 210-63.00R.
McGill, James C.; and Scott, William N., to HT Management Company. Adsorption-absorption vapor recovery system. 4,066,423, Cl. 55-48.000.
McGinniss, Vincent D., to SCM Corporation. Dual cure cathodic electrocoating composition. 4,066,523, Cl. 204-159.150.
McGonigal, Charles: *See*—
Bierenfeld, Herbert H.; McGonigal, Charles; Horton, Chauncey M., Jr.; and Kelsey, John A., 4,066,317, Cl. 339-91.00R.
McGraw-Edison Company: *See*—
Davies, David Peter, 4,066,203, Cl. 228-180.00R.
Vandas, Edward B., 4,066,064, Cl. 126-299.00E.
McGregor, William H.; and Dougherty, Joseph J., to American Home Products Corporation. Purification of synthetic somatostatin. 4,066,634, Cl. 260-112.50S.
McIntosh, Colin Leslie, to Du Pont de Nemours, E. I., and Company. Plant growth retardant compositions containing iminocarbonylphosphonates and iminocarbonylphosphonates. 4,066,434, Cl. 71-86.000.
McKay, Tom W.: *See*—
Lawrence, Walter W., Jr.; McKay, Tom W.; and Wiegand, Karl E., 4,066,688, Cl. 260-535.00P.

McKee, Donald H., to Food Research, Inc. Coating pizza products. 4,066,796, Cl. 426-302.000.

McNair, Samuel L., to Dazey Products Company. Method of using a home donut maker. 4,066,797, Cl. 426-307.000.

McNally, Paul F., to Contraves-Goerz Corporation. Analog signal isolator. 4,066,973, Cl. 330-10.000.

Mead Corporation, The: *See—*
Calvert, Rodney K.; and Landrum, Charles Rabun, 4,066,009, Cl. 93-53.00M.

Mears, Stowell Whitney. Method and apparatus for constructing buildings. 4,065,906, Cl. 52-745.000.

Mecklenborg, Richard A., to Singer Company, The. Visual display apparatus. 4,065,859, Cl. 35-12.00N.

Medi-Physics, Inc.: *See—*
Garrett, Michael David, 4,066,742, Cl. 424-1.000.

Medical Engineering Corporation: *See—*
Finney, Roy P.; and Lynch, Henry Wilfred, 4,066,073, Cl. 128-79.000.

Medpro, Inc.: *See—*
Gorran, Jody A., 4,065,819, Cl. 5-371.000.

Medrano, Joseph, Jr. Load adjustable release device. 4,066,288, Cl. 294-83.00R.

Medtronic, Inc.: *See—*
Alferness, Clifton A.; and Adams, John M., 4,066,086, Cl. 128-421.000.

Meeks, Crawford R., Jr. Compressible fluid velocity measuring instrument. 4,065,966, Cl. 73-228.000.

Meggs, Daniel H.; and Beny, Janos. Self-adjusting wrench. 4,065,986, Cl. 81-128.000.

Mehnert, Gottfried. Multi-stage method of blow molding hollow shaped articles. 4,066,726, Cl. 264-89.000.

Mehnert, Walter, to TECHNICO Development and Financing S.A. Electronic hand grenade. 4,066,019, Cl. 102-70.20R.

Meier, Heinz, to Landes Manufacturing Company. Adjustable carrier apparatus to define furniture or the like. 4,066,293, Cl. 297-325.000.

Meier, Heinz, to Landes Manufacturing Company. Adjustable carrier apparatus to define furniture or the like. 4,066,294, Cl. 297-325.000.

Meininger, Fritz: *See—*
Fuchs, Hermann; Kapaun, Gustav; and Meininger, Fritz, 4,066,638, Cl. 260-196.000.

Melaja, Asko J.; Virtanen, Jouko J.; and Heikkila, Heikki O., to Suomen Sokeri Osakeyhtio (Finnish Sugar Company). Method for recovering xylitol. 4,066,711, Cl. 260-637.00R.

Melco: *See—*
Champan, Louis W.; and Perkins, Arthur T., 4,066,846, Cl. 179-16.0EC.

Menard, Marcel; Lim, Gary M. F.; and Conway, Terry T., to Bristol-Myers Company. 0-2-Isocephem-4-carboxylic acid derivatives as antibacterial agents. 4,066,832, Cl. 544-105.000.

Mendenhall, Robert L. Mixing apparatus. 4,066,247, Cl. 366-24.000.

Merck & Co., Inc.: *See—*
Cragoe, Edward J., Jr.; Bicking, John B.; and Smith, Robert L., 4,066,675, Cl. 260-400.000.
Cragoe, Edward J., Jr.; Bicking, John B.; and Smith, Robert L., 4,066,692, Cl. 424-312.000.
Denny, George H., 4,066,661, Cl. 260-326.150.
Veber, Daniel F.; Nutt, Ruth F.; and Hirschmann, Ralph F., 4,066,749, Cl. 424-177.000.

Merckel, Gerard: *See—*
Borel, Joseph; Lacour, Jacques; and Merckel, Gerard, 4,065,847, Cl. 29-578.000.

Merenyi, Ferenc: *See—*
Jonsson, Nils Ake; Merenyi, Ferenc; and Westlund, Lars-Erik, 4,066,408, Cl. 23-230.00R.

Meresz, Henry; and Tranquilla, Michael N., to G. D. Searle & Co. Synchronized drive and cable handling system for a rotational machine element. 4,065,978, Cl. 74-82.000.

Merkle, Paul. Lock for safety cut-out switch. 4,066,856, Cl. 200-44.000.

Metal Box Limited: *See—*
Shutie, Orin S.; and Jenkins, Leonard A., 4,066,038, Cl. 118-218.000.

Mey, William; and Bailey, David S., to Eastman Kodak Company. Selenium containing multi-active photoconductive element. 4,066,455, Cl. 96-1.50R.

Meyer, Russell L., to American Express Company. Method and apparatus for synchronizing data and clock signals. 4,065,862, Cl. 364-200.000.

MFE Corporation: *See—*
Burke, Edward, Jr., 4,066,958, Cl. 324-125.000.

Miaskoff, Leonard, to Harris Corporation. Orbital turn. 4,066,162, Cl. 198-377.000.

Michaels, Raymond John: *See—*
Lee, Cheuk Man; Michaels, Raymond John; and Harris, Louis Selig, 4,066,667, Cl. 260-345.300.

Michalon, Daniel; and Rolin, Pierre, to Centre Stephanois de Recherches. Chain with links of variable length. 4,066,161, Cl. 198-334.000.

Micheli, Antoine, to DEMATEX Development & Investment Establishment. Vial stopper for blood sampling device. 4,066,067, Cl. 128-2.00F.

Micromeritics Instrument Corporation: *See—*
Ball, Dean M.; Fincher, Robert C.; and Orr, Clyde, Jr., 4,066,536, Cl. 209-155.000.

Middleton, Verne L.: *See—*
Kleine, Charles A.; and Middleton, Verne L., 4,066,121, Cl. 165-170.000.

Miessen, Ralf: *See—*
Wolf, Gerhard Dieter; Miessen, Ralf; Kunzel, Hans Egon; and Bentz, Francis, 4,066,396, Cl. 8-178.00A.

Miles Laboratories, Inc.: *See—*
Cornelius, Dennis Alfred; Eberts, Nancy Jane; and Sternberg, Moshe M., 4,066,799, Cl. 426-534.000.
Woessner, Warren Dexter; Biddlecom, William Gerard; Arndt, Henry Clifford; Peruzzotti, George Peter; and Sih, Charles John, 4,066,834, Cl. 560-121.000.

Milkovic, Miran, to General Electric Company. Electronic volt-square-hour metering method and apparatus. 4,066,959, Cl. 324-141.000.

Milkovic, Miran, to General Electric Company. Electronic kilowatt-hour-meter with error correction. 4,066,960, Cl. 324-142.000.

Millauer, Hans; and Pistorius, Rudolf, to Hoechst Aktiengesellschaft. Process for preparing chlorinated hydroquinone dimethyl ethers. 4,066,708, Cl. 260-613.00D.

Miller Fluid Power Corporation: *See—*
Bowbin, John F., 4,065,852, Cl. 308-3.500.

Miller, Gerald W.: *See—*
D'Altroy, Frederick A.; Harrington, Daniel J.; and Miller, Gerald W., 4,066,483, Cl. 148-187.000.

Miller, Raymond M.; and Teti, John J. Time-domain filter for recursive type signals. 4,066,878, Cl. 364-724.000.

Miller, Warren Hastings, Jr.: *See—*
Arends, Thomas Clark; and Miller, Warren Hastings, Jr., 4,066,342, Cl. 350-288.000.

Milliken Research Corporation: *See—*
Carroll, Clifford Charles, 4,066,397, Cl. 8-192.000.

Millipore Corporation: *See—*
Lai, Chung Jung; and Goldin, Stanley M., 4,066,512, Cl. 195-127.000.

Millns, Colin: *See—*
Johnson, Christopher Linley; and Millns, Colin, 4,066,386, Cl. 417-199.00A.

Mills, Melvin E., Jr.: *See—*
Carlin, Joseph T.; Ware, James W.; Mills, Melvin E., Jr.; and Wells, John A., 4,066,124, Cl. 166-252.000.

Milone, Louis. Mechanical coupling for marine vehicles. 4,066,030, Cl. 114-230.000.

Milton Roy Company: *See—*
Leaver, Brian E.; and Dudley, William F., Jr., 4,066,879, Cl. 364-498.000.

Mimura, Koji; Kawai, Atsushi; Kametani, Yoshiya; and Nakahama, Tetsuro, to Mitsubishi Rayon Co., Ltd. Method for producing regenerated cellulose fibers having excellent flameproofness. 4,066,730, Cl. 264-191.000.

Mimura, Yasuo, to Maruishi Cycle Industries, Ltd. Device for changing the gear ratio of a variable speed gear mounted to a bicycle. 4,065,983, Cl. 74-625.000.

Minami, Hidehiro; and Waku, Makio. Two barrel carburetor. 4,065,920, Cl. 60-276.000.

Minnesota Mining and Manufacturing Company: *See—*
Dickson, Arthur D., 4,066,925, Cl. 313-503.000.
Langford, Nathaniel P.; and Perrault, Edward W., 4,066,589, Cl. 260-29.60H.
Pletcher, Wayne A.; and Wong, Roy, 4,066,600, Cl. 260-30.60R.
Taylor, Allen L.; and Sheffield, William F., 4,067,056, Cl. 361-233.000.

Minolta Camera Kabushiki Kaisha: *See—*
Kameda, Hiromi; and Inagaki, Sanji, 4,066,352, Cl. 355-3.0TE.
Kuramoto, Yoshio; Imura, Toshinori; and Kikukawa, Yoshiiku, 4,067,030, Cl. 354-139.000.

Mischler, Philip G.: *See—*
Kamp, Arthur J.; and Mischler, Philip G., 4,066,898, Cl. 250-359.000.

Mita, Kunio: *See—*
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; Mita, Kunio; Kawasaki, Masahiro; and Mori, Chiharu, 4,067,023, Cl. 354-23.00D.

Mitchell, Thomas A.: *See—*
Hawk, Roger M.; and Mitchell, Thomas A., 4,066,948, Cl. 324-30.00R.

Mitsubishi Chemical Industries Ltd.: *See—*
Ashida, Kaneyoshi; Frisch, Kurt C.; and Kordomenos, Panagiotis, 4,066,628, Cl. 260-77.50R.
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tonomura, Shinji; Tamao, Yoshikuni; Tezuka, Tohru; and Hijikata, Akiko, 4,066,758, Cl. 424-244.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,066,759, Cl. 424-244.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,066,773, Cl. 424-267.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Akamatsu, Masahiko, 4,066,956, Cl. 363-131.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Tsukamoto, Hidehiko; and Maeda, Nobutaka, 4,065,948, Cl. 72-108.000.

Mitsubishi Rayon Co., Ltd.: *See—*
Mimura, Koji; Kawai, Atsushi; Kametani, Yoshiya; and Nakahama, Tetsuro, 4,066,730, Cl. 264-191.000.

Mitsui Toatsu Chemicals, Incorporated: *See—*
Nakatani, Kiyoshi; Imamura, Juichi; Ichikawa, Toshiyuki; Takeuchi, Kouichi; and Kotaka, Kenji, 4,066,707, Cl. 260-613.00R.

Miura, Katsuhiko, to Alps Electric Co., Ltd. High frequency electrical shield assembly. 4,066,837, Cl. 174-35.0GC.

Miyaguchi, Masao: *See—*
Takagi, Atsushi; Kuroiwa, Hiroyuki; Miyaguchi, Masao; and Kawamura, Tateo, 4,065,928, Cl. 61-36.00R.

Miyahara, Junji: *See—*
Kato, Hisatoyo; and Miyahara, Junji, 4,066,332, Cl. 350-126.000.

Miyake, Akio: *See—*
Oka, Yoshikazu; Miyake, Akio; Tada, Norio; and Itoh, Katsumi, 4,066,648, Cl. 260-268.0TR.

Miyashiro, Hiroshi: *See—*
Sakamoto, Masakatsu; Watanabe, Syosaku; Karino, Takafumi; Yazu, Junichi; Takashima, Kouichi; Miyashiro, Hiroshi; Takagi, Takeo; and Konno, Takao, 4,066,298, Cl. 302-2.00R.

Miyoshi, Kunisuke: *See—*
Shimoyama, Yoshiaki; and Miyoshi, Kunisuke, 4,066,479, Cl. 148-111.000.

Mizushima, Masashi: *See—*
Okamoto, Yukio; and Mizushima, Masashi, 4,066,929, Cl. 315-169.0TV.

Mobay Chemical Corporation: *See—*
Rawlings, Herbert L.; and Baron, Arthur L., 4,066,617, Cl. 260-45.80A.

Mobil Oil Corporation: *See—*
Givens, Wyatt W., 4,066,892, Cl. 250-270.000.
Hungerford, Gordon P., 4,066,731, Cl. 264-216.000.
Napier, Roger P.; and Chapman, Orville L., 4,066,719, Cl. 260-970.000.
Nnadi, John C., 4,066,561, Cl. 252-33.400.
Owen, Hartley; Venuto, Paul B.; and Rosinski, Edward J., 4,066,531, Cl. 208-120.000.
Rodewald, Paul G., 4,066,714, Cl. 260-682.000.
Waite, Jerry M.; and Burdyn, Ralph F., 4,066,126, Cl. 166-273.000.

Moeller & Neumann GmbH: *See—*
Morath, Gunther, 4,065,949, Cl. 72-164.000.

Moeller, Richard E., to General Electric Company. Process for preparing a polysiloxane. 4,066,594, Cl. 260-29.20M.

Moen, Lowell J., to Caterpillar Tractor Co. Wear-resistant composite material and method of making an article thereof. 4,066,422, Cl. 51-309.00R.

Moffett, F. Wesley, Jr. Portable garden and method of producing same. 4,065,876, Cl. 47-83.000.

Mogavero, Louis N.; Johnson, Edwin G.; Evans, John M., Jr; and Albus, James S., to United States of America, National Aeronautics and Space Administration. System and method for tracking a signal source. 4,067,015, Cl. 343-225.000.

Mohan, William L.: *See—*
Linton, John D.; Willits, Samuel P.; and Mohan, William L., 4,065,860, Cl. 35-25.000.

Mohri, Yoshio; Hiroishi, Takashi; Sano, Kinzi; Huruya, Koichi; Muramoto, Tadashi; and Tao, Masato, to Central Glass Company, Limited. Alkali-resistant glass composition. 4,066,465, Cl. 106-50.000.

Mold, Donald F.; and Rice, Ronald G., to Owens-Illinois, Inc. Recuperator structures and method of making same. 4,066,120, Cl. 165-165.000.

Molins Limited: *See—*
Maw, Philip Arthur, 4,065,880, Cl. 51-247.000.

Moller, Bynum W. Treadmill exercising device. 4,066,257, Cl. 272-69.000.

Monogram Industries, Inc.: *See—*
Blick, John S., III; and Fuller, Ralph N., 4,065,885, Cl. 52-143.000.

Monotype Corporation Limited, The: *See—*
Baylis, Howard Raymond; Edwards, Roger Alan; and Hedgeland, David Richard Sweatman, 4,067,021, Cl. 346-76.00L.

Monroe, Kenneth E.: *See—*
Waldorf, Lindsey E.; and Monroe, Kenneth E., 4,066,934, Cl. 318-139.000.

Monsanto Company: *See—*
Howe, Robert K., 4,066,435, Cl. 71-86.000.
Reilly, Joseph R.; and Witkowski, Leonard J., 4,066,727, Cl. 264-94.000.

Montagnon, Paul A. F. Analytic device and method. 4,066,511, Cl. 195-103.50M.

Montague, Archer A., Jr. Watchband. 4,065,834, Cl. 24-204.000.

Montron Corporation: *See—*
Ciupke, Werner W., 4,066,348, Cl. 352-129.000.

Moore, Alexander Joseph; Taylor, David Alexander; and Greene, David James, to BICC Limited. Electromagnetic waveguides. 4,066,987, Cl. 333-95.00R.

Moore, Charles R.: *See—*
Costanza, Samuel T.; Franklin, Peter G.; Gebhardt, Frank L.; Israel, Jack D.; Moore, Charles R.; and Wheatley, Charles E., III, 4,066,964, Cl. 325-55.000.

Moore, Leota J.; and Landwer, Robert G. Exhaust recycling and carbon monoxide eliminator for combustion engines. 4,066,052, Cl. 123-119.00A.

Morath, Gunther, to Moeller & Neumann GmbH. Straightening apparatus. 4,065,949, Cl. 72-164.000.

Mores, Lee R.; McCarthy, Justin P.; and Slack, James J., to Emery Industries, Inc. Blends of lanolin wax and esters of aliphatic polyols and fatty acids. 4,066,789, Cl. 424-365.000.

Morey, Everett D.; and Dooley, Eddie W., to General Electric Company. Reusable water softener system for clothes washer. 4,066,393, Cl. 8-137.000.

Morgan, Thomas D.; and Regier, Robert B., to Phillips Petroleum Company. Determination of deuterium concentration in water. 4,066,404, Cl. 23-230.0EP.

Mori, Chiharu: *See—*
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; Mita, Kunio; Kawasaki, Masahiro; and Mori, Chiharu, 4,067,023, Cl. 354-23.00D.

Mori, Eiko: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou, 4,066,615, Cl. 260-45.8NT.

Mori, Yutaka. Process camera. 4,066,357, Cl. 355-66.000.

Morimoto, Kiyoshi: *See—*
Takagi, Toshinori; Morimoto, Kiyoshi; and Utamura, Yukihiko, 4,066,527, Cl. 204-192.00N.

Morimura, Syoji: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou, 4,066,615, Cl. 260-45.8NT.

Morino, Ronald: *See—*
Burr, Robert Page; Morino, Ronald; and Keogh, Raymond J., 4,065,850, Cl. 29-625.000.

Morioka, Hajimu: *See—*
Tosaka, Osamu; Morioka, Hajimu; Hirakawa, Hayao; Ishii, Kenji; Kubota, Koji; and Hirose, Yoshio, 4,066,501, Cl. 195-29.000.

Morley, John Godfrey, to National Research Development Corporation. Fixation and/or support means. 4,065,903, Cl. 52-704.000.

Morrill, Daniel F., to Ford Aerospace & Communications Corporation. Shunt modulator for high current arc lamp. 4,066,931, Cl. 315-241.00R.

Mortimer, James R.: *See—*
Reese, Thomas J.; Tobin, Melvin W.; and Mortimer, James R., 4,066,429, Cl. 65-107.000.

Morton, Douglas Ross, Jr., to Upjohn Company, The. 3,7-Inter-m-phenylene-4,5,6-trinor-PGD$_1$ compounds. 4,066,836, Cl. 560-53.000.

Morton, George Ira: *See—*
Heuner, Robert Charles; Goldman, Michael Barnett; Niemiec, Stanley Joseph; and Morton, George Ira, 4,066,918, Cl. 307-304.000.

Morton-Norwich Products, Inc.: *See—*
Pelosi, Stanford S., Jr., 4,066,668, Cl. 260-347.300.
Pelosi, Stanford S., Jr., 4,066,669, Cl. 260-347.500.
Pelosi, Stanford S., Jr.; White, Ronald E.; Wright, George C.; and Yu, Chia Nien, 4,066,670, Cl. 260-347.700.
Pelosi, Stanford S., Jr., 4,066,671, Cl. 260-347.700.
Pelosi, Stanford S., Jr., 4,066,672, Cl. 260-347.700.

Moskal, John J.: *See—*
Bachman, Paul L.; and Moskal, John J., 4,066,459, Cl. 96-45.200.

Motorola, Inc.: *See—*
Althaus, Raymond L., 4,067,011, Cl. 343-6.8LC.
Gaicki, Stanley, 4,067,039, Cl. 357-65.000.
Huntington, Robert Charles, 4,066,919, Cl. 307-353.000.
Shaw, Mark Layne, 4,066,874, Cl. 235-92.0CM.
Shaw, Mark Layne; and Weber, Howard Fredrick, 4,066,876, Cl. 235-92.0CM.

Mott, Stuart A.: *See—*
Nelson, Lawrence B.; Mott, Stuart A.; and Flugger, Ray T., 4,065,857, Cl. 34-30.000.

Mourning, Michael C.: *See—*
Waxman, Burton H.; Mourning, Michael C.; and Panasik, Theodore, 4,066,456, Cl. 96-29.00D.

Moyson, Joseph, to General Electric Company. Method of manufacture of a gold diffused thyristor. 4,066,484, Cl. 148-187.000.

Mueller, Martin, to Owens-Illinois, Inc. Method and apparatus for sealing tamper-indicating tabs to a container sidewall. 4,065,908, Cl. 53-15.000.

Mueller, Martin, to Owens-Illinois, Inc. Method and apparatus for applying a lid and tamper-indicating sheet to a container. 4,065,909, Cl. 53-15.000.

Muko, Sakae. Fish-feeder. 4,065,870, Cl. 43-44.990.

Muller, Albrecht, to Ciba-Geigy Corporation. Curable mixtures based on polyimides of unsaturated dicarboxylic acids and indole compounds. 4,066,621, Cl. 260-47.0UA.

Muller, Franz: *See—*
Gierse, Franz-Josef; Bastert, Carl-Christian; and Busch, Wilhelm, 4,065,837, Cl. 26-9.000.

Multorgan S.A.: *See—*
Stark, Walter, 4,066,544, Cl. 210-64.000.

Munk, Edmund, to Furnier-und Sperrholzwerk J. F. Werz Jr. KG Werzalit Pressholzwerk. Knock-down partition wall system. 4,065,898, Cl. 52-241.000.

Munninghoff, Clement W., to Cincinnati Electronics Corporation. Programmed presentation system. 4,067,050, Cl. 360-40.000.

Muramoto, Tadashi: *See—*
Mohri, Yoshio; Hiroishi, Takashi; Sano, Kinzi; Huruya, Koichi; Muramoto, Tadashi; and Tao, Masato, 4,066,465, Cl. 106-50.000.

Murata, Masahiro, to Hope Co., Ltd. Ski boot heel binding having improved unlocking device. 4,066,277, Cl. 280-626.000.

Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou, to Sankyo Company Limited. Polymer compositions containing piperidine derivatives as stabilizers. 4,066,615, Cl. 260-45.8NT.

Murch, Robert M.; Wilson, Mary Lynn; and Wood, Louis Leonard, to W. R. Grace & Co. Heavily loaded flame retardant urethane and method. 4,066,578, Cl. 260-2.5AG.

Murphy, Frederick V.: *See—*
Seppi, Edward J.; and Murphy, Frederick V., 4,066,901, Cl. 250-360.000.

Muszumanski, Trude: *See—*
Besenmatter, Walter; Muszumanski, Trude; and Wendisch, Irmgard, 4,066,340, Cl. 350-184.000.

Muth, Karl: *See—*
Weber, Helmut; Muth, Karl; Weyer, Rudi; Aumuller, Walter; and Haack, Erich, 4,066,639, Cl. 260-239.0BF.

Myers, George D.; Walters, Paul W.; and Cottage, Robert L., to Ashland Oil, Inc. Separation of catalyst from effluent of a fluidized catalytic hydrocarbon conversion process. 4,066,533, Cl. 208-153.000.

N. F. Doweave, Inc.: *See—*
Halton, Murray; Dow, Norris F.; Dow, Richard M.; and Hillebrand, Michael J., 4,066,104, Cl. 139-11.000.

N. V. Bekaert S. A.: *See—*
Binard, Edouard, 4,066,202, Cl. 228-173.00E.

Nadeau, Richard G.: *See—*
Johnson, Donald R.; Nadeau, Richard G.; Nieuweboer, Gerrit; and Truett, William L., 4,066,412, Cl. 23-253.00R.

Naden, David: *See—*
Harris, Norman; and Naden, David, 4,066,704, Cl. 260-604.00R.

Nagao, Kameji: *See—*
Sera, Hidefumi; and Nagao, Kameji, 4,066,636, Cl. 260-117.000.

Nagarajan, Kuppuswamy; Arya, Vishwa Prakash; and George, Thomas, to Ciba-Geigy Corporation. Tetrahydroimidazole compounds useful as pharmaceuticals. 4,066,778, Cl. 424-273.00R.

Nagata, Wataru: *See—*
Hamashima, Yoshio; Yoshioka, Mitsuru; Tanida, Hiroshi; Tsuji, Teruji; Narisada, Masayuki; Komeno, Taichiro; and Nagata, Wataru, 4,066,641, Cl. 544-17.000.

Nagel, John G. Extension pull through device to allow for easier passage of flexible fiber endoscope. 4,066,071, Cl. 128-7.000.

Nair, Vijay Gopalan; Joseph, Joseph Peter; and Bernstein, Seymour, to American Cyanamid Company. Malto-dextrin poly(H-)sulfates. 4,066,829, Cl. 536-103.000.

Naito, Hirokuni; Yoshimura, Isao; Takao, Norito; and Kawame, Yasuta, to Asahi-Dow Limited. Ethylene-vinyl acetate film suitable for stretch wrapping. 4,066,811, Cl. 428-220.000.

Nakahama, Tetsuro: *See—*
Mimura, Koji; Kawai, Atsushi; Kametani, Yoshiya; and Nakahama, Tetsuro, 4,066,730, Cl. 264-191.000.

Nakajima, Fumio; Machida, Takayasu; and Yamada, Kenji, to Citizen Watch Company Limited. Stepping motor for electronic timepiece. 4,066,947, Cl. 318-696.000.

Nakajima, Kazuo, to Xenoah, Co. Internally accommodated speed change mechanism applicable to a bicycle. 4,065,984, Cl. 74-750.00B.

Nakajima, Kiminori; and Shigenobu, Ikuo, to Echo Co., Ltd. Water cock with non-freezing valve. 4,066,090, Cl. 137-62.000.

Nakamura, Kousuke: *See—*
Shimazoe, Michitaka; Nakamura, Kousuke; Matsushita, Yasuo; Shimada, Satoshi; Yamada, Kazuji; and Takahashi, Yukio, 4,065,971, Cl. 73-727.000.

Nakamura, Michiei: *See—*
Horiguchi, Shojiro; Nakamura, Michiei; and Sugito, Yoshifumi, 4,066,462, Cl. 106-14.000.

Nakamura, Yuji, to Matsushita Electric Industrial Co., Ltd. Cartridge type magnetic recording and reproducing system. 4,067,051, Cl. 360-95.000.

Nakano, Eiichi: *See—*
Sando, Yoshikazu; Ishidoshiro, Hiroshi; and Nakano, Eiichi, 4,066,541, Cl. 210-51.000.

Nakatani, Hirokuni; Takamura, Toru; Hiroshima, Yoshimitsu; and Hashimoto, Susumu, to Matsushita Electronics Corporation. Solid state imaging device. 4,067,046, Cl. 358-213.000.

Nakatani, Kiyoshi; Imamura, Juichi; Ichikawa, Toshiyuki; Takeuchi, Kouichi; and Kotaka, Kenji, to Agency of Industrial Science & Technology; and Mitsui Toatsu Chemicals, Incorporated. Method for manufacture of diphenols and monoalkyl ethers of diphenols. 4,066,707, Cl. 260-613.00R.

Nakazawa, Atushi; and Ono, Muneichi, to Nippon Pulp Industry Company Limited. Method of producing microcapsules. 4,066,568, Cl. 252-316.000.

Nalco Chemical Company: *See—*
Choca, Monica E., 4,066,572, Cl. 252-437.000.

Napier, Loyd S. Bow string release device. 4,066,060, Cl. 124-35.00A.

Napier, Roger P.; and Chapman, Orville L., to Mobil Oil Corporation. Selective phosphorylation process. 4,066,719, Cl. 260-970.000.

Napierski, Reinhard Hans. Fluid inflatable spatially expandable hollow body construction. 4,065,888, Cl. 52-2.000.

Narang, Ashish: *See—*
Narang, Rajendra K.; Narang, Manish; and Narang, Ashish, 4,066,109, Cl. 144-28.110.

Narang, Manish: *See—*
Narang, Rajendra K.; Narang, Manish; and Narang, Ashish, 4,066,109, Cl. 144-28.110.

Narang, Rajendra K.; Narang, Manish; and Narang, Ashish. Pencil sharpener with replaceable blades. 4,066,109, Cl. 144-28.110.

Narey, James O.: *See—*
Saylor, William H.; and Narey, James O., 4,067,006, Cl. 340-325.000.

Narisada, Masayuki: *See—*
Hamashima, Yoshio; Yoshioka, Mitsuru; Tanida, Hiroshi; Tsuji, Teruji; Narisada, Masayuki; Komeno, Taichiro; and Nagata, Wataru, 4,066,641, Cl. 544-17.000.

National Can Corporation: *See—*
Lyu, Seung W., 4,065,951, Cl. 72-349.000.

National Forge Company: *See—*
Witkin, Donald E.; and Bowles, Arnold G., 4,066,868, Cl. 219-486.000.

National Marine Service, Incorporated: *See—*
Walters, Chester H.; Barmeier, Harold J., Jr.; and Sullivan, Greig E., 4,066,545, Cl. 210-71.000.

National Research Development Corporation: *See—*
Fray, Adrian Forrest; and Jones, David, 4,066,334, Cl. 350-160.0LC.
Morley, John Godfrey, 4,065,903, Cl. 52-704.000.

National Semiconductor Corporation: *See—*
Compton, James B.; and Ochi, Sam S., 4,066,917, Cl. 307-304.000.

NCR Corporation: *See—*
Heys, George, Jr., 4,066,850, Cl. 200-5.00A.
Koetsch, Philip W., 4,067,055, Cl. 361-159.000.

Nebel, Otto T.; Trujillo, Louis J.; and Russell, Carl C., to United States of America, Navy. Self developing camera for use in macrophotography and endoscopic pathology. 4,067,025, Cl. 354-62.000.

Needham, Richard P.: *See—*
Czajka, Thomas S.; and Needham, Richard P., 4,066,593, Cl. 260-29.20E.

Neef, Guenter: *See—*
Eder, Ulrich; Sauer, Gerhard; Haffer, Gregor; Neef, Guenter; and Wiechert, Rudolf, 4,066,674, Cl. 260-397.500.

Neely, Homer E., Jr., to PPG Industries, Inc. Low pollution glass fiber compositions. 4,066,466, Cl. 106-50.000.

Negele, James R.: *See—*
Wiegert, Gerald A.; and Negele, James R., 4,066,290, Cl. 296-78.100.

Nelson, Gunner E.; and Pearson, Tillmon H., to Ethyl Corporation. 2,3-Carboxy alkoxy succinic acid and salts thereof. 4,066,687, Cl. 260-535.00P.

Nelson, Lawrence B.; Mott, Stuart A.; and Flugger, Ray T., to Sunfresh Products. Dehydrator and method for dehydrating foodstuffs. 4,065,857, Cl. 34-30.000.

Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-3,7-inter-m-phenylene-9-dioxy-PGD_1 compounds. 4,066,701, Cl. 260-590.00C.

Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-3,7-inter-m-phenylene-9-deoxy-9,10-didehydro-PGH_1 cpompounds. 4,066,702, Cl. 260-590.00C.

Nerthersole, Douglas C.: *See—*
Dudley, Michael A.; Parthasarathy, Mellapalayam R.; and Nerthersole, Douglas C., 4,066,040, Cl. 118-629.000.

Neslon, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-3,7-inter-m-phenylene-3-oxa-PGD_1 compounds. 4,066,700, Cl. 260-590.00C.

Nett, Louis A. Ventilating apparatus including exhaust filter exchanger. 4,066,425, Cl. 55-242.000.

Neu, Gustav; and Bemmerl, Hans-Ferdinand, to Bochumer Eisenhutte Heintzmann GmbH & Co. Guiding arrangement for underground excavating systems. 4,065,931, Cl. 61-45.00D.

Neuenschwander, Rudolf, to Scott Paper Company. Apparatus for forming a fibrous structure. 4,065,832, Cl. 19-156.300.

Neuhoff, Charles J. Process for detecting electrical faults. 4,067,052, Cl. 361-42.000.

Neuzil, Richard W.: *See—*
Rosset, Armand J.; and Neuzil, Richard W., 4,066,677, Cl. 260-428.500.

Newton, Ralph E., to Westinghouse Electric Corporation. Gas-filled incandescent lamp with integral fuse assembly. 4,066,926, Cl. 315-73.000.

Nieder-Vahrenholz, Hans-Georg: *See—*
Bockelmann, Wolfgang; Nieder-Vahrenholz, Hans-Georg; Niederprum, Hans; and Jonas, Heinz, 4,066,734, Cl. 423-61.000.

Niederprum, Hans: *See—*
Bockelmann, Wolfgang; Nieder-Vahrenholz, Hans-Georg; Niederprum, Hans; and Jonas, Heinz, 4,066,734, Cl. 423-61.000.

Nielsen, Arnold T., to United States of America, Navy. 2,3,7,8-Tetraazaspiro [4.4]nonane, 2,3,7,8-tetraazaspiro-[4.4]nona-2,7-diene and derivatives. 4,066,833, Cl. 548-356.000.

Nieman, Charles Wayne; Turkovich, Robert Peter; and Castronovo, Robert Frank, to Trident Products Inc. Valve unit for liquid dispensers. 4,066,187, Cl. 222-57.000.

Niemiec, Stanley Joseph: *See—*
Heuner, Robert Charles; Goldman, Michael Barnett; Niemiec, Stanley Joseph; and Morton, George Ira, 4,066,918, Cl. 307-304.000.

Nieuweboer, Gerrit: *See—*
Johnson, Donald R.; Nadeau, Richard G.; Nieuweboer, Gerrit; and Truett, William L., 4,066,412, Cl. 23-253.00R.

Nilsson, Gert Erik; and Oberg, Ake Per, to Servo Med AB. Method and apparatus for determining the amount of a substance emitted by diffusion from a surface such as a derm surface. 4,066,068, Cl. 128-2.00R.

Nippon Chemicals Co., Ltd.: *See—*
Shidara, Hideo, 4,066,683, Cl. 260-465.50R.

Nippon Electric Company, Ltd.: *See—*
Tsuzuki, Naobumi; Anazawa, Shinzo; and Noguchi, Shozo, 4,067,040, Cl. 357-74.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Hirose, Yasunori, 4,065,993, Cl. 84-1.030.
Yoshida, Takashi; and Ishida, Katsuhiko, 4,067,036, Cl. 357-22.000.

Nippon Kayaku Kabushiki Kaisha: *See*—
Takagi, Kenkichi; Yamamoto, Yukio; Yamazaki, Tadao; Yamaguchi, Hiroshi; and Umezawa, Hamao, 4,066,507, Cl. 195-80.00R.
Nippon Kokan Kabushiki Kaisha: *See*—
Uchida, Kuniki; Araki, Kenzi; Fukunaka, Shiro; and Kurihara, Takao, 4,066,474, Cl. 148-2.000.
Nippon Light Metal Co., Ltd.: *See*—
Sato, Toshihiko, 4,066,516, Cl. 204-15.000.
Nippon Oil and Fats Co., Ltd.: *See*—
Kasama, Tsuneo; Wada, Makoto; Sano, Masakatu; and Tsuji, Shinzo, 4,066,415, Cl. 23-281.000.
Nippon Pulp Industry Company Limited: *See*—
Nakazawa, Atushi; and Ono, Muneichi, 4,066,568, Cl. 252-316.000.
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Segawa, Yoshihiro; Sato, Susumu; Yasuda, Eturo; Hattori, Tadashi; and Aoki, Keiji, 4,066,413, Cl. 23-254.00E.
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Egerstrom, Bengt Gunnar Wilhelm, 4,066,093, Cl. 137-355.200.
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Nnadi, John C., to Mobil Oil Corporation. Organometallic compounds and compositions thereof with lubricants. 4,066,561, Cl. 252-33.400.
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Cunningham, Richard D., 4,065,964, Cl. 73-150.00A.
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Eisentraut, Anna M., 4,066,410, Cl. 23-230.600.
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Jones, John W. D.; and Oakey, Keith R., 4,066,946, Cl. 318-685.000.
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Mains, Harold E.; Williams, Frederick R.; and O'Brien, William L., 4,066,587, Cl. 260-22.00D.
Ochi, Sam S.: *See*—
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Ochsner, Paul Albert, to Givaudan Corporation. Unsaturated alcohol. 4,066,710, Cl. 260-631.500.
O'Connor, Chadwell. Rotating fluidized bed combustor. 4,066,024, Cl. 110-8.00F.
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Oldshue, James Y. Replacement valve assembly. 4,066,113, Cl. 152-430.000.
Olin Corporation: *See*—
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Kleine, Charles A.; and Middleton, Verne L., 4,066,121, Cl. 165-170.000.
Olink, Jan; and Dela Ruye, Jacques, to BFG Glassgroup. Glazing for transmitting solar radiation. 4,066,815, Cl. 428-336.000.
Ollington, David R.; and Zala, Ishver L. High speed pulse counter. 4,066,875, Cl. 235-92.0TF.
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and Corrado, Pasquale A. Sludge hydroextractor. 4,066,548, Cl. 210-160.000.
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Johnson, Alan J.; Soberano, Mercedes E.; Ong, Eng Bee; and Levy, Milton, 4,066,506, Cl. 195-66.00B.
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Ono Pharmaceutical Company: *See—*
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Oppelt, John Christian; and Susi, Peter Vincent, to American Cyanamid Company. Heterocyclicamides of hindered 3,5-dialkyl-4-hydroxybenzoic acids and use as light stabilizers in polyolefins. 4,066,614, Cl. 260-45.8NZ.
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Oroshnik, William, to SCM Corporation. Intermediates for Vitamin A. 4,066,685, Cl. 560-260.000.
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O'Toole, Jerome; Wright, David M.; and Hedstrom, Norman A., to Wright Line Inc. Reference manual stand. 4,066,168, Cl. 211-4.000.
Ott, James I.; and Schwab, Delmar G., to Hyster Company. Load lifting and lowering control system. 4,065,922, Cl. 60-445.000.
Ovshinsky, Stanford R.: *See—*
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Collins, Johnny Will; Kochmanis, Gunars; and Lynch, Bobby Ross, 4,066,174, Cl. 214-7.000.
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Pacific Electronic Enterprises Inc.: *See—*
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Palac, Kazimir, to Zenith Radio Corporation. Method for introducing a high voltage conductor into a television cathode ray tube. 4,066,310, Cl. 316-19.000.
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Panasik, Theodore; Viro, Felix; Waxman, Burton H.; and Shannahan, Robert T., to GAF Corporation. Color developer for diffusion transfer. 4,066,457, Cl. 96-29.00D.
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Panov, Vadim Ivanovich; Tkach, Grigory Anatolievich; Tomenko, Viktor Mikhailovich; Zolotukhin, Boris Mikhailovich; and Belyaev, Erik Konstantinovich. Carbonating tower for producing sodium bicarbonate magma. 4,066,416, Cl. 23-283.000.
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Park, Kyu C.; and Reisman, Arnold, to International Business Machines Corporation. Method for fabricating a DSDT target. 4,065,840, Cl. 29-25.140.
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Pascale, Joseph Andrew. Rotary filter. 4,066,555, Cl. 210-402.000.
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Pellico, Michael A. Abrasion resistant elastomeric composition. 4,066,602, Cl. 260-30.80R.
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Woessner, Warren Dexter; Biddlecom, William Gerard; Arndt, Henry Clifford; Peruzzotti, George Peter; and Sih, Charles John, 4,066,834, Cl. 560-121.000.

Peters, James W.; and Hardesty, Charles, to Southwire Company. Single cut shear. 4,065,992, Cl. 83-285.000.

Peterson, Charles L., to Uarco Incorporated. Continuous envelope assembly. 4,066,206, Cl. 229-69.000.

Petroleo Brasileiro S.A. Petrobras: *See—*
Garcia, Roberto, 4,066,532, Cl. 208-131.000.

Pfarrer, David M.; and Van Essen, Leonard J., to Lennox Industries, Inc. Control circuit for a two speed single phase motor. 4,066,937, Cl. 318-221.00G.

Pfatischer, Ludwig. Larding utensil. 4,065,830, Cl. 17-42.100.

Pfefferle, William C., to Engelhard Minerals & Chemicals Corporation. Method of starting a combustion system utilizing a catalyst. 4,065,917, Cl. 60-39.82C.

Pfizer Inc.: *See—*
Barth, Wayne E., 4,066,657, Cl. 260-306.70R.
Blackwood, Robert K.; and Stephens, Charles R., Jr., 4,066,694, Cl. 260-559.0AT.
Kadin, Saul B., 4,066,766, Cl. 424-251.000.
Kraska, Allen R.; and Schnur, Rodney C., 4,066,696, Cl. 260-564.00R.

Phalangas, Charalambos J., to Hercules Incorporated. Imidazole polymers and preparation thereof with radiation and chemical initiator. 4,066,524, Cl. 204-159.230.

Pham, Quang Minh; and Soffer, Jacques, to Societe Generale de Constructions Electriques et Mecaniques Alsthom. Static switching device for two direct current machines. 4,066,933, Cl. 318-60.000.

Phillips, Carmen S.; Beyer, Ralph E.; and Sepich, Gerald E., to International Harvester Company. Offset baler with steerable control. 4,065,914, Cl. 56-341.000.

Phillips Petroleum Company: *See—*
Anderson, Kenneth L.; and Kuper, Donald G., 4,066,632, Cl. 260-79.100.
Cines, Martin R.; and Buchanan, Ben B., 4,066,538, Cl. 210-15.000.
Drake, Charles A.; and Cowan, Glyndal D., 4,066,417, Cl. 23-289.000.
Gray, Peter R., 4,066,891, Cl. 250-253.000.
Harris, Jesse R., 4,066,712, Cl. 260-668.00D.
Morgan, Thomas D.; and Regier, Robert B., 4,066,404, Cl. 23-230.0EP.
Rohde, Raymond, 4,066,559, Cl. 252-10.000.

Pickard, Keith John, to Laporte Industries Limited. Treating cellulosic materials. 4,066,493, Cl. 162-158.000.

Pietruszewski, John Joseph; Scaccia, Carl; and Wagner, Ralph James, to Union Carbide Corporation. Apparatus for sparging gas into liquid. 4,066,722, Cl. 261-87.000.

Pioneer Electronic Corporation: *See—*
Takaoka, Saburo; and Fujie, Norikazu, 4,066,935, Cl. 318-138.000.

Pioneer Products, Inc.: *See—*
Eguizabal, Julian, 4,065,866, Cl. 42-51.000.

Piper, Jack Richard; and Kaczmarek, Leo W., to International Telephone and Telegraph Corporation. Vertical float switch. 4,066,858, Cl. 200-84.00C.

Pissiotas, Georg: *See—*
von Bredow, Brigitta; and Pissiotas, Georg, 4,066,437, Cl. 71-91.000.

Pistorius, Rudolf: *See—*
Millauer, Hans; and Pistorius, Rudolf, 4,066,708, Cl. 260-613.00D.

Pitney-Bowes, Inc.: *See—*
Beck, Christian A.; Ross, William A.; and Burke, James E., 4,066,220, Cl. 242-55.000.

Pitt Metals and Chemicals, Inc.: *See—*
Horn, Richard E., 4,066,518, Cl. 204-86.000.

Piwonka, Thomas S.: *See—*
Blazek, William S.; Piwonka, Thomas S.; Jackson, James D.; and Atanmo, Philip N., 4,066,116, Cl. 164-17.000.

Plaskitt, David Edmund: *See—*
Burrow, Reginald Edward Dowton; and Plaskitt, David Edmund, 4,065,935, Cl. 61-95.000.

Plasmatronics Company: *See—*
Noe, John B., 4,066,053, Cl. 123-148.0CA.

Platt, Vernon H.; and Wilmot, Richard D., to Hughes Aircraft Company. Tracking feedback clutter mapper control device. 4,067,012, Cl. 343-7.00A.

Plentz, Rudolf. Brake cylinder for a hydraulic brake. 4,066,153, Cl. 188-196.00M.

Pletcher, Terry Carl: *See—*
Kleinschuster, Jacob John; and Pletcher, Terry Carl, 4,066,620, Cl. 260-47.00C.

Pletcher, Wayne A.; and Wong, Roy, to Minnesota Mining and Manufacturing Company. Friction-activatable adhesive and articles thereof. 4,066,600, Cl. 260-30.60R.

Plursch, Gerald; and Leuchter, Jurgen, to AGFA-Gevaert, AG. Daylight developing machine. 4,067,035, Cl. 354-313.000.

Poe, Ronald Laurence: *See—*
Holliday, Leland Robert; and Poe, Ronald Laurence, 4,066,682, Cl. 260-462.00R.

Poignant, Jean-Claude: *See—*
Beregi, Laszlo; Hugon, Pierre; Pascaud, Xavier; and Poignant, Jean-Claude, 4,066,662, Cl. 260-326.850.

Pointner, Martin, to Siemens Aktiengesellschaft. Method and apparatus for the production of stacked, etched patterned metal foils for component elements. 4,065,839, Cl. 29-17.00R.

Polaroid Corporation: *See—*
Chiklis, Charles K., 4,066,814, Cl. 428-333.000.

Polatovshaya, Olga Grigorievna: *See—*
Bashkovich, Alexandr Pavlovich; Zimnukhova, Evgenia Semenovna; Prokopovich, Agnessa Vladimirovna; Polatovshaya, Olga Grigorievna; Pronina, Maria Ivanovna; Kulbakh, Valter Osvaldovich; Rivkina-Pevtsova, Khasya Ionovna; and Grinberg, Grigory Efimovich, 4,066,503, Cl. 195-62.000.

Polko, Peter R., to Uarco Incorporated. Stationery printing apparatus for continuous business forms stationery assemblies. 4,066,015, Cl. 101-228.000.

Pommer, Ernst-Heinrich; Hagen, Helmut; and Fleig, Helmut, to BASF Aktiengesellschaft. Certain fungitoxic 2-halo-5-trichloromethyl-1,3,4-thiadiazoles. 4,066,775, Cl. 424-270.000.

Pond, Stephen F., to Xerox Corporation. Excessive magnetic developer displacement system. 4,067,018, Cl. 346-74.100.

Popa, Aurel: *See—*
Teodorescu, Gheorghe Marcel; and Popa, Aurel, 4,066,049, Cl. 123-48.00R.

Porter, Robert Warwick: *See—*
Kilgren, Arnold William; Low, David Nicholson; and Porter, Robert Warwick, 4,066,424, Cl. 55-71.000.

Poulson, Daniel A., to Heath Company. Multiple gun cathode ray tube testing, cleaning, and rejuvenating apparatus. 4,066,311, Cl. 316-28.000.

Poussart, Denis; and Ganguly, Udaya, to Canadian Patents and Development Limited. Transfer function measurement. 4,067,060, Cl. 364-553.000.

Powell, William H.: *See—*
Winters, Donald C.; Haemer, Laurence F.; and Powell, William H., 4,066,813, Cl. 426-282.000.

Power-Gas Corporation Limited, The: *See—*
Harris, Norman; and Naden, David, 4,066,704, Cl. 260-604.00R.

PPG Industries, Inc.: *See—*
Franz, Helmut, 4,066,430, Cl. 65-116.000.
Graham, Roy R., 4,066,106, Cl. 139-420.00C.
Neely, Homer E., Jr., 4,066,466, Cl. 106-50.000.
Reese, Thomas J.; Tobin, Melvin W.; and Mortimer, James R., 4,066,429, Cl. 65-107.000.

Rinehart, Jay K., 4,066,440, Cl. 71-119.000.
Rowley, James R., 4,066,287, Cl. 294-74.000.
Scriven, Roger L.; and Chang, Wen-Hsuan, 4,066,591, Cl. 260-29.2TN.
Wismer, Marco; and Bosso, Joseph F., 4,066,592, Cl. 260-29.2EP.

Prechtl, Alfred: *See—*
Burger, Manfred R.; Gagel, Ernst; Kalmovicz, Rudolf; and Prechtl, Alfred, 4,065,937, Cl. 62-89.000.

Premus, Donald D. Universal axial spacer for mounting fan on pump shaft and drive pulley. 4,066,048, Cl. 123-41.490.

Preus, Paul. Barrier construction for water carried pollutants. 4,065,923, Cl. 61-1.00F.

Price, Richard T.; and Prodell, Rita C., to Akzona Incorporated. Serological reagent, test slide and method for gonorrheal antibodies. 4,066,744, Cl. 424-12.000.

Procter & Gamble Company, The: *See—*
Hughes, Amy Gray, 4,066,075, Cl. 128-127.000.

Prodell, Rita C.: *See—*
Price, Richard T.; and Prodell, Rita C., 4,066,744, Cl. 424-12.000.

Prohaska, Peter J. H. Rotary tool assembly having removable working elements. 4,066,379, Cl. 408-125.000.

Prokopovich, Agnessa Vladimirovna: *See—*
Bashkovich, Alexandr Pavlovich; Zimnukhova, Evgenia Semenovna; Prokopovich, Agnessa Vladimirovna; Polatovshaya, Olga Grigorievna; Pronina, Maria Ivanovna; Kulbakh, Valter Osvaldovich; Rivkina-Pevtsova, Khasya Ionovna; and Grinberg, Grigory Efimovich, 4,066,503, Cl. 195-62.000.

Pronina, Maria Ivanovna: *See—*
Bashkovich, Alexandr Pavlovich; Zimnukhova, Evgenia Semenovna; Prokopovich, Agnessa Vladimirovna; Polatovshaya, Olga Grigorievna; Pronina, Maria Ivanovna; Kulbakh, Valter Osvaldovich; Rivkina-Pevtsova, Khasya Ionovna; and Grinberg, Grigory Efimovich, 4,066,503, Cl. 195-62.000.

Provost, John K.; and Lien, Charles, to Venus Scientific Inc. Low light level camera with parallel-connected slidably mounted intensifier assemblies. 4,067,045, Cl. 358-211.000.

Przybyla, Franciszek J.; and Smith, Michael J., to P. R. Mallory & Co. Inc. Self sealing microporous membrane for electrochemical cells and method of forming same. 4,066,822, Cl. 429-27.000.

Pujol, Carlos Oliver. Disc for grinder. 4,066,215, Cl. 241-46.110.

Pungor, Erno; and Varadi, Maria, to Labor Muszeripari Muvek. Process and apparatus for the voltammetric measurement of the quantity or mass of separated sample components. 4,066,406, Cl. 23-230.00R.

Quessette, Jacques Alain: *See—*
Bertaux, Jean-Loup; and Quessette, Jacques Alain, 4,066,904, Cl. 250-372.000.

Quick, Donald J., to Massey-Ferguson Services N.V. Cane cutting apparatus. 4,065,912, Cl. 56-13.900.

Quinn, Peter T., to Honeywell, Inc. Calculator. 4,067,024, Cl. 354-23.00R.

R. Jung AG Fabrik fur Prazisionsapparate: *See—*
Behme, Werner; and Berleth, Manfred, 4,066,728, Cl. 264-162.000.

Raabe, Thomas; Grawinger, Otto; Scholtholt, Josef; Nitz, Rolf-Eberhard; and Schraven, Eckhard, to Cassella Farbwerke Mainkur Aktiengesellschaft. Derivatives of 1-phenoxy-3-amino-propan-2-ol. 4,066,768, Cl. 424-263.000.

Raduka, Janos: *See—*
Vukasovic, Lovro; and Raduka, Janos, 4,066,954, Cl. 363-37.000.

Rager, Charles L., to Raymond Lee Organization, Inc., The, a part interest. T lever adapter. 4,065,987, Cl. 81-177.00A.

Rainwater, Orman M. Collapsible shelter structure. 4,066,089, Cl. 135-3.00E.

Ralston Purina Company: *See—*
Chou, Shih-Toon, 4,066,754, Cl. 424-229.000.

Ramanthan, Visvanathan, to Ciba-Geigy Corporation. Basic diaminopyridine-(3)-azo dyestuffs. 4,066,637, Cl. 260-146.00R.

Ramesohl, Hubert: *See—*
Brachthauser, Kunibert; Ramesohl, Hubert; Beisner, Klaus; and Herchenbach, Horst, 4,066,470, Cl. 106-100.000.

Ramirez, Fausto: *See—*
Henderson, William Arthur, Jr.; and Ramirez, Fausto, 4,066,783, Cl. 424-289.000.

Ramot University Authority for Applied Research and Industrial Development Ltd.: *See—*
Arcan, Mircea; Robin, Gordon; and Simkin, Ariel, 4,066,082, Cl. 128-303.00R.

Rao, Bhaskara M. L.; and Silbernagel, Bernard G., to Exxon Research & Engineering Co. Cell containing chalcogenide cathode, alkali metal anode and solid halo-aluminum alkali metal compound electrolyte. 4,066,824, Cl. 429-50.000.

Rauscher, Elli; Bernt, Erich; Gruber, Wolfgang; and Determann, Helmut, to Boehringer Mannheim GmbH. Process and reagent for determining triglycerides. 4,066,508, Cl. 195-99.000.

Rawlings, Herbert L.; and Baron, Arthur L., to Mobay Chemical Corporation. Stabilized poly(alkylene terephthalates). 4,066,617, Cl. 260-45.80A.

Ray, Louis M., Jr.; Pease, Leo L.; and Brown, Henry C. Truck bed tilting mechanism. 4,066,296, Cl. 298-22.00J.

Raychem GmbH: *See—*
Allgaier, Werner, 4,066,840, Cl. 174-72.00R.

Raymond Lee Organization, Inc., The: *See—*
Buchek, Francis Z., 4,066,155, Cl. 190-3.000.
Pavese, Bud M., 4,066,145, Cl. 182-153.000.
Rager, Charles L., 4,065,987, Cl. 81-177.00A.

Raytheon Company: *See—*
Bryden, Joseph E., 4,067,007, Cl. 340-347.0SY.
Gallani, Zvi; and Sullivan, Joseph A., 4,066,983, Cl. 331-117.00R.

RCA Corporation: *See—*
Carlson, David John, 4,067,000, Cl. 340-171.00R.
Hall, James Robert, 4,067,010, Cl. 343-6.8LC.
Heuner, Robert Charles; Goldman, Michael Barnett; Niemiec, Stanley Joseph; and Morton, George Ira, 4,066,918, Cl. 307-304.000.
Norman, Marvin Neil, 4,067,048, Cl. 358-243.000.
Rosnowski, Wojciech; and Denning, Richard, 4,066,485, Cl. 148-188.000.

Read, Norman Weldon, to Dresser Industries, Inc. Seal means for valve assembly. 4,066,241, Cl. 251-361.000.

Recherche et Industrie Therapeutiques: *See—*
Crooij, Pierre; and Simonet, Guy, 4,066,664, Cl. 260-332.20H.

Rechter, Harold L., to Chicago Fire Brick Company. Aluminous refractory composition containing carbon. 4,066,467, Cl. 106-56.000.

Recticel Deutschland Kunststoffe GmbH: *See—*
Eiselt, Gunter, 4,065,910, Cl. 53-24.000.

Redmond, John D., Jr., to Gates Rubber Company, The. Toothed belt making. 4,066,732, Cl. 264-229.000.

Reed, Donald M. Dimensional gauging apparatus. 4,065,854, Cl. 35-168.00R.

Reese, Thomas J.; Tobin, Melvin W.; and Mortimer, James R., to PPG Industries, Inc. Bending glass sheets to a tapered line of bend. 4,066,429, Cl. 65-107.000.

Reeves, Adam A., to Paraho Corporation. Method of design for vertical oil shale retorting vessels and retorting therewith. 4,066,529, Cl. 208-11.00R.

Regier, Robert B.: *See—*
Morgan, Thomas D.; and Regier, Robert B., 4,066,404, Cl. 23-230.0EP.

Rehn, Gary Allen, to Deere & Company. Disk harrow with beam member suspended by U-shaped springs. 4,066,132, Cl. 172-572.000.

Reichel, Pavel: *See—*
Novak, Petr; Pellant, Michal; and Reichel, Pavel, 4,067,042, Cl. 357-82.000.

Reichert, Dieter. Switch for controlling door locks. 4,065,812, Cl. 200-11.00R.

Reilly, Eugene P.: *See—*
Borman, Willem F. H.; and Reilly, Eugene P., 4,066,627, Cl. 260-75.00M.

Reilly, Joseph R.; and Witkowski, Leonard J., to Monsanto Company. Method for continuous stretch-blow molding. 4,066,727, Cl. 264-94.000.

Reinhard, Clyde J., to Birtcher Corporation, The. Isolation amplifier. 4,066,974, Cl. 330-10.000.

Reisman, Arnold: *See—*
Park, Kyu C.; and Reisman, Arnold, 4,065,840, Cl. 29-25.140.

Reiss, Karl-Hans: *See—*
Kuhn, Gerhard; Ubler, Karl; and Reiss, Karl-Hans, 4,066,896, Cl. 250-315.00A.

Rescalli, Carlo: *See—*
Faraci, Rocco; Rescalli, Carlo; and Catini, Stefano, 4,066,713, Cl. 260-677.00A.

Reuschling, Dieter-Bernd; and Jensen, Harald, to Hoechst Aktiengesellschaft. Process for the preparing α-chloroacrylic acid chlorides. 4,066,690, Cl. 260-544.00Y.

Revy von Belvard, Peter: *See—*
Freudenschuss, Otto; Kantner, Otto; and Revy von Belvard, Peter, 4,066,345, Cl. 352-27.000.

Reynolds, Donald F. Car wash mop. 4,066,366, Cl. 401-285.000.

Rhodes, William A.: *See—*
Rodriguez, Paul L.; and Rhodes, William A., 4,066,920, Cl. 310-310.000.

Rhone-Poulenc Industries: *See—*
Bardonnet, Claude; Brun, Robert; and Pages, Michel, 4,066,553, Cl. 210-321.00R.

Riat, Henri; and Hegar, Gert, to Ciba-Geigy Corporation. Sulfophenylamino containing tetrareactive triazine disazo dyestuffs and dyestuff compositions thereof. 4,066,389, Cl. 8-41.00R.

Ribnitz, Peter: *See—*
Buschor, Karl; and Ribnitz, Peter, 4,066,041, Cl. 118-629.000.

Ricardo & Co., Engineers (1927) Limited: *See—*
Ford-Dunn, Martin Douglas, 4,066,050, Cl. 123-73.0SP.

Rice, Edward K., to Unicon Parking Structures, Inc. Demountable multiple level building structures. 4,065,907, Cl. 52-747.000.

Rice, Ronald G.: *See—*
Mold, Donald F.; and Rice, Ronald G., 4,066,120, Cl. 165-165.000.

Richardson, Harold W., to Richmore Company. Portable viscometer apparatus. 4,065,959, Cl. 73-56.000.

Richardson-Merrell Inc.: *See—*
Blohm, Thomas R.; Grisar, J. Martin; and Parker, Roger Alan, 4,066,788, Cl. 424-333.000.

Richmore Company: *See—*
Richardson, Harold W., 4,065,959, Cl. 73-56.000.

Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcs, 4,066,709, Cl. 260-618.00B.

Ricoh Company, Ltd.: *See—*
Koide, Hiroshi; Iida, Katsuhiko; Ataka, Hisanori; and Homae, Taisaburo, 4,066,350, Cl. 353-27.00R.

Ridings, Robert Paul, Jr.; and Lanier, Raymond Henry, to Communications Satellite Corporation. Adaptable zero order predictor for speech predictive encoding communications systems. 4,066,844, Cl. 179-15.0BW.

Riechers, Daniel: *See*—
Haberle, Fritz; Riechers, Daniel; and Hochrathner, Alfred, 4,066,286, Cl. 293-87.000.
Rieger, Gerhard: *See*—
Junge, Peter; Schulz, Horst; Schneider, Rainer; Dreke, Werner; and Rieger, Gerhard, 4,066,818, Cl. 428-341.000.
Ries, Karl: *See*—
Grabendorfer, Werner; Vogt, Herbert; Haacke, Harri; Kuhn, Harry; Pawelletz, Reinhard; and Ries, Karl, 4,065,960, Cl. 73-627.000.
Ries, Peter E., to Pentapharm A.G. Sterile surgical collagen product. 4,066,083, Cl. 128-325.000.
Rifkin, Ellis B., to Ethyl Corporation. Exhaust systems. 4,065,918, Cl. 60-274.000.
Riker Laboratories, Inc.: *See*—
Scherrer, Robert A., 4,066,782, Cl. 424-285.000.
Rinehart, Jay K., to PPG Industries, Inc. Symmetrical alkynyl ureas. 4,066,440, Cl. 71-119.000.
Rivkina-Pevtsova, Khasya Ionovna: *See*—
Bashkovich, Alexandr Pavlovich; Zimnukhova, Evgenia Semenovna; Prokopovich, Agnessa Vladimirovna; Polatovshaya, Olga Grigorievna; Pronina, Maria Ivanovna; Kulbakh, Valter Osvaldovich; Rivkina-Pevtsova, Khasya Ionovna; and Grinberg, Grigory Efimovich, 4,066,503, Cl. 195-62.000.
Rizzo, Victor L., to Upjohn Company, The. Arthropodicidal formamidines. 4,066,765, Cl. 424-248.560.
Robert Bosch G.m.b.H.: *See*—
Heiser, Joachim, 4,066,006, Cl. 91-433.000.
Voss, Klaus, 4,066,133, Cl. 173-12.000.
Wanner, Karl; Hahner, Reinhard; Schmid, Wolfgang; Hansel, Gernot; and Bleicher, Manfred, 4,066,136, Cl. 173-48.000.
Robert, Jacques: *See*—
Dargent, Bruno; and Robert, Jacques, 4,066,333, Cl. 350-160.0LC.
Robertshaw Controls Company: *See*—
Bechtel, Jon H., 4,066,867, Cl. 219-483.000.
Robin, Gordon: *See*—
Arcan, Mircea; Robin, Gordon; and Simkin, Ariel, 4,066,082, Cl. 128-303.00R.
Robinson, Graham: *See*—
Jones, Ivor Wynn; Robinson, Graham; and Bird, Thomas Lewis, 4,066,826, Cl. 429-104.300.
Robinson, William H.; Allen, David O.; and Wombold, Harry A. E., to Buckeye Molding Company. Container and closure assembly. 4,066,181, Cl. 215-256.000.
Roch, Jacques L., to Electroglas, Inc. High speed precision chuck assembly. 4,066,943, Cl. 318-468.000.
Rocha, John G., to United States of America, Army. Gun lock and firing mechanism for 30mm cannon. 4,065,998, Cl. 89-11.000.
Rockwell International Corporation: *See*—
Costanza, Samuel T.; Franklin, Peter G.; Gebhardt, Frank L.; Israel, Jack D.; Moore, Charles R.; and Wheatley, Charles E., III, 4,066,964, Cl. 325-55.000.
George, Peter K.; and Kobayashi, Tsutomu, 4,067,003, Cl. 365-12.000.
Juhasz, John Emil, 4,067,061, Cl. 364-900.000.
Manasevit, Harold M.; and Simpson, William I., 4,066,481, Cl. 148-174.000.
Rockwell-Rimoldi S.p.A.: *See*—
Marforio, Nerino, 4,066,027, Cl. 112-121.150.
Rodewald, Paul G., to Mobil Oil Corporation. Manufacture of light olefins. 4,066,714, Cl. 260-682.000.
Rodgers, Robert E., Jr. Metal-plastic composite racquet. 4,066,260, Cl. 273-73.00C.
Rodgers, Rolza J., to Ross Agricultural Company, Inc. Pea shelling apparatus. 4,066,087, Cl. 130-30.00H.
Rodriguez, Paul L.; and Rhodes, William A. Electrostatically chargeable device. 4,066,920, Cl. 310-310.000.
Rohde, Raymond, to Phillips Petroleum Company. Container for oil-additive release. 4,066,559, Cl. 252-10.000.
Rolin, Pierre: *See*—
Michalon, Daniel; and Rolin, Pierre, 4,066,161, Cl. 198-334.000.
Rollings, Robert William, to Bell Telephone Laboratories, Incorporated. Electrical connector construction. 4,066,316, Cl. 339-91.00R.
Rolls-Royce Limited: *See*—
Johnson, Christopher Linley; and Millns, Colin, 4,066,386, Cl. 417-199.00A.
Romovacek, George R., to Koppers Company, Inc. Method and apparatus for the control of pitch still operation. 4,066,159, Cl. 196-132.000.
Romovacek, George R., to Koppers Company, Inc. Method for making isotropic carbon fibers. 4,066,737, Cl. 423-447.600.
Roper Corporation: *See*—
Fisher, Gerald C.; and Scanland, Joseph E., 4,065,913, Cl. 56-295.000.
Rosen, Irving: *See*—
Li, George S.; and Rosen, Irving, 4,066,717, Cl. 260-874.000.
Rosen, Perry, to Hoffmann-La Roche Inc. 15-Oxasteroids. 4,066,666, Cl. 260-340.9AS.
Rosen, Robert: *See*—
Schultz, Leonard J.; Hamori, Alfred Steven; and Rosen, Robert, 4,066,965, Cl. 325-120.000.
Rosenau, John R.; and Anderson, John C., to University of Minnesota, The Regents of the. Preparation of dairy-based cheese food. 4,066,800, Cl. 426-582.000.
Rosinski, Edward J.: *See*—
Owen, Hartley; Venuto, Paul B.; and Rosinski, Edward J., 4,066,531, Cl. 208-120.000.
Rosnowski, Wojciech; and Denning, Richard, to RCA Corporation. Method of fabricating a semiconductor device. 4,066,485, Cl. 148-188.000.
Ross Agricultural Company, Inc.: *See*—
Rodgers, Rolza J., 4,066,087, Cl. 130-30.00H.
Ross, Haldon, to AMF Incorporated. Self-adjusting bike brake operating mechanism. 4,066,154, Cl. 188-196.0BA.
Ross, Hubertus R. Cartesian toy submarine. 4,065,874, Cl. 46-94.000.
Ross, William A.: *See*—
Beck, Christian A.; Ross, William A.; and Burke, James E., 4,066,220, Cl. 242-55.000.
Rosset, Armand J.; and Neuzil, Richard W., to UOP Inc. Two-stage process for separating mixed fatty-acid esters. 4,066,677, Cl. 260-428.500.
Rostocil, Charles Edward, to Brunswick Corporation. Machine gun. 4,066,000, Cl. 89-198.000.
Rottier, Jacob, to U.S. Philips Corporation. Saturable reactor device for operating a discharge lamp. 4,066,932, Cl. 315-244.000.
Rottloff, Gunther: *See*—
Sundermann, Rudolf; Rottloff, Gunther; and Grigat, Ernst, 4,066,577, Cl. 260-2.00R.
Rounbehler, David P.: *See*—
Fine, David H.; Fronduto, John J.; and Rounbehler, David P., 4,066,411, Cl. 23-253.0PC.
Rowekamp, Edward F., to Lodge & Shipley Company, The. Row former for articles. 4,066,163, Cl. 198-442.000.
Rowley, James R., to PPG Industries, Inc. Sling assembly for lifting sheet material. 4,066,287, Cl. 294-74.000.
Rowman, Philip J. Drum halting system for game apparatus. 4,066,264, Cl. 273-143.00R.
Rublack, Wilfred, to General Electric Company. Screen for slotted aperture mask color television picture tube. 4,066,924, Cl. 313-408.000.
Rudny, Donald F.: *See*—
Vidakovic, Aleksandar; Urman, Stanley; and Rudny, Donald F., 4,066,047, Cl. 123-41.120.
Rudy, Erwin. Carbide compositions for wear-resistant facings and method of fabrication. 4,066,451, Cl. 75-240.000.
Ruh, Wolf-Dieter; and Trippel, Gerhard, to International Business Machines Corporation. Method of simultaneously etching multiple tapered viaducts in semiconductor material. 4,066,491, Cl. 156-644.000.
Ruhrchemie AG: *See*—
Hahn, Heinz-Dieter; and Weber, Jurgen, 4,066,835, Cl. 560-98.000.
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Ruskin, Henry. Staples and production methods. 4,066,165, Cl. 206-340.000.
Russ, Georg: *See*—
Rumold, Gerhard; and Russ, Georg, 4,066,950, Cl. 324-51.000.
Russell, Carl C.: *See*—
Nebel, Otto T.; Trujillo, Louis J.; and Russell, Carl C., 4,067,025, Cl. 354-62.000.
Russo, Andrew, Jr.: *See*—
Pearce, Warren, Jr.; and Russo, Andrew, Jr., 4,066,325, Cl. 339-176.0MP.
Ruthardt, Rolf: *See*—
Kummer, Franz; Mai, Gerhard; Ruthardt, Rolf; and Thiede, Horst, 4,065,851, Cl. 29-630.00R.
Ryan, William H., to Owens-Illinois, Inc. Circuit and method for generating gray scale in gaseous discharge panels. 4,067,047, Cl. 358-240.000.
S.A.E.S. Getters S.p.A.: *See*—
Hellier, Stephen J., 4,066,309, Cl. 316-5.000.
Saatze, Kuno: *See*—
Trattner, Hermann; Saatze, Kuno; and Bauereiss, Adolf, 4,065,956, Cl. 73-9.000.
Saferstein, Lowell: *See*—
Besso, Michael M.; and Saferstein, Lowell, 4,066,623, Cl. 260-47.00C.
Safir, Sidney Robert; and Hofmann, Corris Mabelle, to American Cyanamid Company. Substituted 6-(piperazinyl)-10H-pyrido[3,2-b]thieno[3,4-e][1,4]-diazepines. 4,066,647, Cl. 260-268.0TR.
Saito, Shinichi; Okaue, Asaya; Baba, Kazuo; and Tanaka, Shigeo, to Sumitomo Chemical Company, Limited. Process for the production of ethylene-propylene block copolymers. 4,066,718, Cl. 260-878.00B.
Saito, Toshio; and Kobayashi, Tadahiko, to Fuji Seiki Machine Works, Ltd. Multi-spindle drilling machine. 4,066,378, Cl. 408-46.000.
Sakamoto, Masakatsu; Watanabe, Syosaku; Karino, Takafumi; Yazu, Junichi; Takashima, Kouichi; Miyashiro, Hiroshi; Takagi, Takeo; and Konno, Takao, to Hitachi, Ltd. Hydraulically transported capsule. 4,066,298, Cl. 302-2.00R.
Sala Magnetics, Inc.: *See*—
Marston, Peter G.; and Nolan, John J., 4,066,991, Cl. 335-216.000.
Saleil, Jean; Debras, Maurice; and Malefant, Jean-Yves. Method of making chrome steel in an electric arc furnace. 4,066,442, Cl. 75-12.000.
Salisbury, Winfield W.; and Stiles, Walter J. Earth boring apparatus employing high powered laser. 4,066,138, Cl. 175-16.000.
Salley, Ernest J., to Engineered Systems, Inc. System for pretesting electronic memory locations and automatically identifying faulty memory sections. 4,066,880, Cl. 235-302.300.

Salmond, William G., to Sandoz, Inc. 2-Alkylamino-α-phenyl-1-cyclohexene-1-methyleneimine, its salts and preparation. 4,066,665, Cl. 260-332.500.
Salomon, Georges Pierre Joseph, to S.A. Etablissements Francois Salomon et Fils. Ski brake. 4,066,276, Cl. 280-605.000.
Sam, Georg: *See*—
Bork, Siegfried; and Sam, Georg, 4,066,576, Cl. 252-511.000.
Samsonite Corporation: *See*—
Workman, David E., 4,066,373, Cl. 403-391.000.
Sanchez, Alejandro C. Frangible cap for bottles. 4,066,180, Cl. 215-254.000.
Sanders, David E.: *See*—
Chambers, Ramon P.; Sanders, David E.; and Gordy, Robert S., 4,066,977, Cl. 330-129.000.
Sanders, Robert N.: *See*—
Johnston, James D.; Sanders, Robert N.; and Wood, James M., Jr., 4,066,445, Cl. 75-67.00R.
Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshikazu; Ishidoshiro, Hiroshi; and Nakano, Eiichi, 4,066,541, Cl. 210-51.000.
Sando, Yoshikazu; Ishidoshiro, Hiroshi; and Nakano, Eiichi, to Sando Iron Works Co., Ltd. Process for treating waste water containing polyvinyl alcohol. 4,066,541, Cl. 210-51.000.
Sandoz, Inc.: *See*—
Salmond, William G., 4,066,665, Cl. 260-332.500.
Sankyo Company Limited: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou, 4,066,615, Cl. 260-45.8NT.
Sano, Kinzi: *See*—
Mohri, Yoshio; Hiroishi, Takashi; Sano, Kinzi; Huruya, Koichi; Muramoto, Tadashi; and Tao, Masato, 4,066,465, Cl. 106-50.000.
Sano, Masakatu: *See*—
Kasama, Tsuneo; Wada, Makoto; Sano, Masakatu; and Tsuji, Shinzo, 4,066,415, Cl. 23-281.000.
Santacecilia, Remo: *See*—
Shay, Barry M.; and Santacecilia, Remo, 4,066,558, Cl. 252-8.900.
Santos, Gerard R.: *See*—
Hannum, Joseph R.; and Santos, Gerard R., 4,066,489, Cl. 156-258.000.
Santroch, George: *See*—
Demerson, Christopher A.; Humber, Leslie G.; Santroch, George; Dobson, Thomas A.; and Jirkovsky, Ivo, 4,066,763, Cl. 424-246.000.
Sanyo Electric Co., Ltd.: *See*—
Kishi, Hiroyasu, 4,066,845, Cl. 179-15.0BT.
Sarchet, Douglas P. Wind-driven prime mover. 4,066,911, Cl. 290-44.000.
Sarno, Richard L. Apparatus for splitting logs. 4,066,110, Cl. 144-193.00A.
Sasaki, Jiro, to Toshin Science Co., Ltd.; and Sekisui Kagaku Kogyo Kabushiki Kaisha, part interest to each. Continuous filtering process and an apparatus therefor. 4,066,546, Cl. 210-75.000.
Sasamura, Kohei: *See*—
Ishigaki, Yukinobu; and Sasamura, Kohei, 4,066,972, Cl. 329-134.000.
Sasazawa, Koji; Dezawa, Shin-Ichiro; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Process for producing cobalt- and iron-containing ferromagnetic powder by heat-treatment in the presence of an oxidizing agent. 4,066,564, Cl. 252-62.560.
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Satake Engineering Co., Ltd.: *See*—
Satake, Toshihiko; Kono, Akira; and Yanagihara, Hiromichi, 4,066,012, Cl. 99-618.000.
Satake, Toshihiko; Kono, Akira; and Yanagihara, Hiromichi, to Satake Engineering Co., Ltd. Roll type huller. 4,066,012, Cl. 99-618.000.
Sato, Hiroshi: *See*—
Sato, Ryuichi; Ishikawa, Akira; Ishida, Yukihito; Sato, Hiroshi; Tomisawa, Setsuo; Toyoshima, Shigeshi; and Ikegami, Shiro, 4,066,678, Cl. 260-429.00R.
Sato, Michito: *See*—
Isa, Hiroshi; Ukigai, Toshiyuki; Tominaga, Anri; and Sato, Michito, 4,066,715, Cl. 260-683.15B.
Sato, Ryuichi; Ishikawa, Akira; Ishida, Yukihito; Sato, Hiroshi; Tomisawa, Setsuo; Toyoshima, Shigeshi; and Ikegami, Shiro, to Sato, Ryuichi. 3-Trihydroxygermyl propionic acid and its salts and a process for the production thereof. 4,066,678, Cl. 260-429.00R.
Sato, Shoichi, to Japan Atomic Energy Research Institute. Process for the production of hydrogen by the thermal decomposition of water. 4,066,741, Cl. 423-658.000.
Sato, Susumu: *See*—
Segawa, Yoshihiro; Sato, Susumu; Yasuda, Eturo; Hattori, Tadashi; and Aoki, Keiji, 4,066,413, Cl. 23-254.00E.
Sato, Takao, to Hitachi, Ltd. Abnormal state detecting apparatus utilizing control rod for use in nuclear reactor. 4,066,497, Cl. 176-22.000.
Sato, Toshihiko, to Nippon Light Metal Co., Ltd. Method for forming colorless or colored pattern having shade difference on an aluminum or aluminum alloy article. 4,066,516, Cl. 204-15.000.
Sauer, Gerhard: *See*—
Eder, Ulrich; Sauer, Gerhard; Haffer, Gregor; Neef, Guenter; and Wiechert, Rudolf, 4,066,674, Cl. 260-397.500.
Savit, Carl H., to Western Geophysical Company of America. Limited-range seismic control system. 4,066,993, Cl. 340-15.5TS.
Sawyer, Philip Nicholas. Surgical method of using a sterile packaged prosthesis. 4,065,816, Cl. 3-1.500.
Saxl, Erwin J. Tension meter. 4,065,963, Cl. 73-144.000.
Saylor, William H.; and Narey, James O., to Associated Data Concepts. Changeable alphanumeric sign with opaque tape display forming segmented characters and words. 4,067,006, Cl. 340-325.000.
Scaccia, Carl: *See*—
Pietruszewski, John Joseph; Scaccia, Carl; and Wagner, Ralph James, 4,066,722, Cl. 261-87.000.
Scanland, Joseph E.: *See*—
Fisher, Gerald C.; and Scanland, Joseph E., 4,065,913, Cl. 56-295.000.
Schaar, Charles H., to Colgate-Palmolive Company. Diaper with extensible fastener. 4,066,081, Cl. 128-287.000.
Schachte, John J.: *See*—
Lohneis, Earl R.; and Schachte, John J., 4,065,988, Cl. 82-2.700.
Schaefer, Bruce John: *See*—
Lorenzen, James Walter; and Schaefer, Bruce John, 4,065,823, Cl. 9-9.000.
Schaeffer, Walter: *See*—
Bockenhoff, Hermann-Josef; Schaeffer, Walter; and Kranz, Berthold, 4,066,477, Cl. 148-15.000.
Scharf, Emil; Fikentscher, Rolf; Auhorn, Werner; and Streit, Werner, to BASF Aktiengesellschaft. Nitrogenous condensation products used as retention aids in papermaking. 4,066,494, Cl. 162-164.0EP.
Schatz, Vernon L., to First National Bank of Chicago, The. Identification and access card with associated optical decoding means. 4,066,873, Cl. 235-487.000.
Scheler, Holger, to Hagenuk Vormals Neufeldt & Kuhnke GmbH. Arrangement for feeding rod shaped workpieces to a machine tool. 4,065,989, Cl. 82-38.00A.
Schepp, Horst; and Drawert, Manfred, to Schering Aktiengesellschaft. Printing inks and printing methods employing the same. 4,066,585, Cl. 260-18.00N.
Schering Aktiengesellschaft: *See*—
Eder, Ulrich; Sauer, Gerhard; Haffer, Gregor; Neef, Guenter; and Wiechert, Rudolf, 4,066,674, Cl. 260-397.500.
Schepp, Horst; and Drawert, Manfred, 4,066,585, Cl. 260-18.00N.
Schering Corporation: *See*—
Mallams, Alan K.; and Davies, David Huw, 4,066,752, Cl. 424-180.000.
Scherrer, Hanspeter: *See*—
Boller, Arthur; Cereghetti, Marco; and Scherrer, Hanspeter, 4,066,570, Cl. 252-299.000.
Scherrer, Robert A., to Riker Laboratories, Inc. Antimicrobial (2-nitro-3-benzofuranyl)phenylacetic acids. 4,066,782, Cl. 424-285.000.
Schlegel GmbH: *See*—
Eggert, Frank, 4,065,900, Cl. 52-476.000.
Schlegel (UK) Limited: *See*—
Aardal, Martin John, 4,065,827, Cl. 16-106.000.
Schmid, Wolfgang: *See*—
Wanner, Karl; Hahner, Reinhard; Schmid, Wolfgang; Hansel, Gernot; and Bleicher, Manfred, 4,066,136, Cl. 173-48.000.
Schmidt, John P., to Halcon International, Inc. Preparation of ethylbenzene hydroperoxide. 4,066,706, Cl. 260-610.00B.
Schneider, Michel, to Battelle Memorial Institute. Process for extracting a polypeptide from an aqueous solution. 4,066,505, Cl. 195-66.00R.
Schneider, Rainer: *See*—
Junge, Peter; Schulz, Horst; Schneider, Rainer; Dreke, Werner; and Rieger, Gerhard, 4,066,818, Cl. 428-341.000.
Schnur, Rodney C.: *See*—
Kraska, Allen R.; and Schnur, Rodney C., 4,066,696, Cl. 260-564.00R.
Schoeller-Bleckmann Stahlwerke Aktiengesellschaft: *See*—
Woltron, Klaus; and Stuckler, Peter, 4,066,500, Cl. 176-78.000.
Schoenenberger, Richard J.: *See*—
Hoyer, William A.; Johnson, Lowell W.; and Schoenenberger, Richard J., 4,066,801, Cl. 427-8.000.
Scholes, Addison B.; Dollar, David L.; and Hurst, Robert L., to Ball Corporation. Method for applying lubricating materials to metallic substrates. 4,066,803, Cl. 427-26.000.
Scholl, Charles H.; and Akers, Larry D., to Nordson Corporation. Thermoplastic adhesive dispenser having an internal heat exchanger. 4,066,188, Cl. 222-146.0HE.
Scholtholt, Josef: *See*—
Raabe, Thomas; Grawinger, Otto; Scholtholt, Josef; Nitz, Rolf-Eberhard; and Schraven, Eckhard, 4,066,768, Cl. 424-263.000.
Schraven, Eckhard: *See*—
Raabe, Thomas; Grawinger, Otto; Scholtholt, Josef; Nitz, Rolf-Eberhard; and Schraven, Eckhard, 4,066,768, Cl. 424-263.000.
Schremmer, Wolfgang: *See*—
Breddin, Klaus; and Schremmer, Wolfgang, 4,066,360, Cl. 356-39.000.
Schroder, Ernst: *See*—
Dickopp, Gerhard; and Schroder, Ernst, 4,066,976, Cl. 330-86.000.
Schroeder, Manfred, to Chemische Werke Huis Aktiengesellschaft. Process for the production of pure diglycolic acid by oxidation of diethylene glycol with nitric acid. 4,066,691, Cl. 260-531.00R.
Schubert, Alvin Louis, to Eastman Kodak Company. Scanner alignment mechanism. 4,066,341, Cl. 350-285.000.
Schulte, Fritz, to Hartung, Kuhn & Co Maschinenfabrik GmbH. Coke-oven filling system. 4,066,175, Cl. 214-35.00R.
Schultz, Leonard J.; Hamori, Alfred Steven; and Rosen, Robert, to United States of America, Navy. RF GTWT Saturating circuit. 4,066,965, Cl. 325-120.000.

Schulz, Horst: *See*—
Junge, Peter; Schulz, Horst; Schneider, Rainer; Dreke, Werner; and Rieger, Gerhard, 4,066,818, Cl. 428-341.000.

Schulze, Heinz, to Texaco Development Corporation. Method of producing N,N'-(dimethyl) piperazine compounds. 4,066,649, Cl. 260-268.0SY.

Schur, Sylvia. Instant yogurt preparation. 4,066,794, Cl. 426-61.000.

Schwab, Delmar G.: *See*—
Ott, James I.; and Schwab, Delmar G., 4,065,922, Cl. 60-445.000.

Schwarz, Martin, to BBC Brown Boveri & Company Limited. Control valve. 4,066,100, Cl. 137-625.300.

Schwarz, Wilhelm: *See*—
Hoffmeister, Bernhard; and Schwarz, Wilhelm, 4,066,248, Cl. 266-216.000.

Schwender, Charles F.; and Sunday, Brooks R., to Warner-Lambert Company. 8-(1H-Tetrazol-5-yl)-11H-pyrido[2,1-b]quinazolin-11-ones and method of treating bronchial asthma using them. 4,066,767, Cl. 424-251.000.

Science Union et Cie., Societe Francaise de Recherche Medicale: *See*—
Beregi, Laszlo; Hugon, Pierre; Pascaud, Xavier; and Poignant, Jean-Claude, 4,066,662, Cl. 260-326.850.

SCM Corporation: *See*—
McGinniss, Vincent D., 4,066,523, Cl. 204-159.150.
Oroshnik, William, 4,066,685, Cl. 560-260.000.
Woo, James T. K.; and Evans, James M., 4,066,525, Cl. 204-181.000.

Scott Paper Company: *See*—
Neuenschwander, Rudolf, 4,065,832, Cl. 19-156.300.

Scott, Roderic M., to Perkin-Elmer Corporation, The. Configuration control apparatus. 4,066,343, Cl. 350-295.000.

Scott, William N.: *See*—
McGill, James C.; and Scott, William N., 4,066,423, Cl. 55-48.000.

Scriven, Roger L.; and Chang, Wen-Hsuan, to PPG Industries, Inc. Water-reduced urethane coating compositions. 4,066,591, Cl. 260-29.2TN.

Seddon, John David: *See*—
Blackhall, Alexander; Brydon, Donald Lithgow; and Seddon, John David, 4,066,601, Cl. 260-30.80R.

Seeger, Herbert, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Control arrangement for converter. 4,066,957, Cl. 322-16.000.

Seeger, Richard E.: *See*—
White, James N.; and Seeger, Richard E., 4,066,851, Cl. 200-5.00A.

Segawa, Yoshihiro; Sato, Susumu; Yasuda, Eturo; Hattori, Tadashi; and Aoki, Keiji, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Gas component detection apparatus. 4,066,413, Cl. 23-254.00E.

Seghezzi, Hans Dieter: *See*—
Jochum, Peter; and Seghezzi, Hans Dieter, 4,066,198, Cl. 227-8.000.
Jochum, Peter; and Seghezzi, Hans Dieter, 4,066,199, Cl. 227-10.000.

Seita, Toru; Shimizu, Akihiko; and Kosaka, Yujiro, to Toyo Soda Manufacturing Co., Ltd. Process for producing a polyion complex having a nucleic acid base. 4,066,827, Cl. 526-50.000.

Seizo, Takayama: *See*—
Toyoaki, Ueno; Seizo, Takayama; Kiyoshi, Hashimoto; and Masashi, Uchida, 4,066,189, Cl. 222-334.000.

Sekino, Jun: *See*—
Okazaki, Kiyoshi; Kawada, Hiroitsu; Shimizu, Hidemi; Ohmura, Tadayoshi; and Sekino, Jun, 4,066,787, Cl. 424-317.000.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Sasaki, Jiro, 4,066,546, Cl. 210-75.000.

Sekiya, Hiroshi: *See*—
Machi, Sueo; Wada, Takeshi; and Sekiya, Hiroshi, 4,066,522, Cl. 204-159.240.

Selby, Donald. One piece tube and microscope slide manipulative laboratory device. 4,066,414, Cl. 23-259.000.

Sen-Jung, Chen. Hydraulically controlled artificial leg. 4,065,815, Cl. 3-1.200.

Senkbeil, Herman O.: *See*—
Johnston, Howard; and Senkbeil, Herman O., 4,066,438, Cl. 71-94.000.

Sepich, Gerald E.: *See*—
Phillips, Carmen S.; Beyer, Ralph E.; and Sepich, Gerald E., 4,065,914. Cl. 56-341.000.

Seppi, Edward J.; and Murphy, Frederick V., to Varian Associates, Inc. Tomographic scanning apparatus with improved collimator structure. 4,066,901, Cl. 250-360.000.

Sera, Hidefumi; and Nagao, Kameji, to Fuji Photo Film Co., Ltd. Method of hardening gelatin. 4,066,636, Cl. 260-117.000.

Serck Industries Limited: *See*—
Young, Robert Eric, 4,066,841, Cl. 178-66.00R.

Servo Med AB: *See*—
Nilsson, Gert Erik; and Oberg, Ake Per, 4,066,068, Cl. 128-2.00R.

Setec Travaux Publics: *See*—
Oger, Jacques Francois, 4,065,932, Cl. 61-45.00R.

Severson, Harvey M. Chair and base frame therefor. 4,066,295, Cl. 297-443.000.

SGS-ATES Componenti Elettronici S.p.A.: *See*—
Cossutta, Giuseppe; and Cellai, Marino, 4,066,839, Cl. 174-52.0PE.

Shamlian, Ralph Barr. Mouthpiece retainer tabs. 4,066,077, Cl. 128-145.00A.

Shank, Richard S.; and Hermanson, Fred H. Wood building construction. 4,065,895, Cl. 52-210.000.

Shannahan, Robert T.: *See*—
Panasik, Theodore; Viro, Felix; Waxman, Burton H.; and Shannahan, Robert T., 4,066,457, Cl. 96-29.00D.

Sharp, Austin S., to Wellington Puritan Mills, Inc. Twine winding assembly. 4,066,219, Cl. 242-46.200.

Sharp Kabushiki Kaisha: *See*—
Kawasaki, Hiroshi, 4,066,860, Cl. 200-308.000.

Shaw, Don W., to Texas Instruments Incorporated. Selective epitaxial growth technique for fabricating waveguides for integrated optics. 4,066,482, Cl. 148-175.000.

Shaw, Mark Layne, to Motorola, Inc. Digital speed control system. 4,066,874, Cl. 235-92.0CM.

Shaw, Mark Layne; and Weber, Howard Fredrick, to Motorola, Inc. Digital speed control system. 4,066,876, Cl. 235-92.0CM.

Shay, Barry M.; and Santacecilia, Remo, to ICI Americas Inc. Low viscosity spin finish systems for neat finish application. 4,066,558, Cl. 252-8.900.

Sheasby, Peter Geoffrey; and Cheetham, Graham, to Alcan Research and Development Limited. Electrolytic coloring of anodized aluminium by means of optical interference effects. 4,066,816, Cl. 428-336.000.

Sheffield, William F.: *See*—
Taylor, Allen L.; and Sheffield, William F., 4,067,056, Cl. 361-233.000.

Shell Oil Company: *See*—
Boyce, Clive B. C.; and Webb, Shirley B., 4,066,770, Cl. 424-263.000.
Wharton, David G., 4,066,419, Cl. 44-72.000.

Shenk, Jay D., to Armstrong Cork Company. Method of achieving a two-toned fiberboard product. 4,066,805, Cl. 427-226.000.

Sherosky, Frank. Brush shave device. 4,066,367, Cl. 401-286.000.

Shibuya, Hajime; and Shirato, Shiroh, to Kaken Chemical Co., Ltd. Miticidal method. 4,066,781, Cl. 424-283.000.

Shidara, Hideo, to Nippon Chemicals Co., Ltd. Process for the preparation of diaminomaleonitrile. 4,066,683, Cl. 260-465.50R.

Shiel, Leslie Edward; and Jones, Kenneth Wilson, to Associated Portland Cement Manufacturers Limited, The. Rapid hardening cement. 4,066,469, Cl. 106-89.000.

Shigehiro, Kosuke: *See*—
Shintani, Tsutomu; Ozeki, Azuhiro; Kunihiro, Haruo; and Shigehiro, Kosuke, 4,066,703, Cl. 260-592.000.

Shigenobu, Ikuo: *See*—
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Shikoku Paper Mfg. Co., Ltd.: *See*—
Ayukawa, Buichiro, 4,066,542, Cl. 210-51.000.

Shima, Takeo: *See*—
Kawase, Shoji; Kuratsuji, Takatoshi; Inata, Hiroo; Suzuki, Kazuyoshi; and Shima, Takeo, 4,066,624, Cl. 260-49.000.

Shimada, Satoshi: *See*—
Shimazoe, Michitaka; Nakamura, Kousuke; Matsushita, Yasuo; Shimada, Satoshi; Yamada, Kazuji; and Takahashi, Yukio, 4,065,971, Cl. 73-727.000.

Shimadzu Seisakusho Ltd.: *See*—
Iwanaga, Masaya, 4,066,895, Cl. 250-296.000.

Shimamura, Isao; Ishiguro, Shoji; and Ogawa, Junkichi, to Fuji Photo Film Co., Ltd. Color photographic process. 4,066,461, Cl. 96-66.300.

Shimazoe, Michitaka; Nakamura, Kousuke; Matsushita, Yasuo; Shimada, Satoshi; Yamada, Kazuji; and Takahashi, Yukio, to Hitachi, Ltd. Semiconductor pressure transducer. 4,065,971, Cl. 73-727.000.

Shimizu, Akihiko: *See*—
Seita, Toru; Shimizu, Akihiko; and Kosaka, Yujiro, 4,066,827, Cl. 526-50.000.

Shimizu, Hidemi: *See*—
Okazaki, Kiyoshi; Kawada, Hiroitsu; Shimizu, Hidemi; Ohmura, Tadayoshi; and Sekino, Jun, 4,066,787, Cl. 424-317.000.

Shimoyama, Yoshiaki; and Miyoshi, Kunisuke, to Nippon Steel Corporation. Process for producing non-directional electric steel sheets free from ridging. 4,066,479, Cl. 148-111.000.

Shin Nihon Ryokugaku Kabushiki Kaisha: *See*—
Yoshimi, Mitsuru, 4,066,490, Cl. 156-276.000.

Shintani, Tsutomu; Ozeki, Azuhiro; Kunihiro, Haruo; and Shigehiro, Kosuke, to Sumitomo Chemical Company, Limited. Method for producing aromatic hydroxide and aliphatic ketone. 4,066,703, Cl. 260-592.000.

Shirato, Shiroh: *See*—
Shibuya, Hajime; and Shirato, Shiroh, 4,066,781, Cl. 424-283.000.

Shoberg, Ralph S., to GSE, Inc. Load cell. 4,065,962, Cl. 73-141.00A.

Shoemaker, Arthur H., to American Optical Corporation. Optometer eyepiece. 4,066,339, Cl. 350-175.00E.

Shono, Tetsuji: *See*—
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; Mita, Kunio; Kawasaki, Masahiro; and Mori, Chiharu, 4,067,023, Cl. 354-23.00D.

Shrader, Thomas E. Soapstone sharpener. 4,065,887, Cl. 51-358.000.

Shultz, Gilbert F., to Whitlock, Inc. Control for hopper loader for granular materials. 4,066,245, Cl. 366-139.000.

Shutie, Orin S.; and Jenkins, Leonard A., to Metal-Box Limited. Printing and coating apparatus. 4,066,038, Cl. 118-218.000.

Sieber, Axel, to Behringwerke Aktiengesellschaft. Process for producing a bond between polyvinylene glycol and a substance containing primary amino groups. 4,066,581, Cl. 260-8.000.

Siemens Aktiengesellschaft: *See*—
Dassler, Joachim; Veneklasen, Lee H.; and Zschimmer, Martin, 4,066,905, Cl. 250-396.00R.
Gross, Franz, 4,066,927, Cl. 315-3.500.
Hoffmann, Kurt, 4,067,001, Cl. 365-174.000.
Kobale, Manfred; Krueger, Hans; and Lorenz, Hans-Peter, 4,066,337, Cl. 350-160.0LC.

Kuhn, Gerhard; Ubler, Karl; and Reiss, Karl-Hans, 4,066,896, Cl. 250-315.00A.
Kuny, Wilhelm, 4,066,985, Cl. 333-72.000.
Pointner, Martin, 4,065,839, Cl. 29-17.00R.
Rumold, Gerhard; and Russ, Georg, 4,066,950, Cl. 324-51.000.
Stoger, Klaus; Dotzer, Richard; and Gehring, Johann, 4,066,515, Cl. 204-14.00N.
Trattner, Hermann; Saatze, Kuno; and Bauereiss, Adolf, 4,065,956, Cl. 73-9.000.
Vukasovic, Lovro; and Raduka, Janos, 4,066,954, Cl. 363-37.000.
Wirbser, Oskar; and Ernst, Nikolaus, 4,066,204, Cl. 228-264.000.

Siems, Siemer. Voltage regulator circuit for an electron microscope. 4,066,971, Cl. 328-267.000.

Sih, Charles John: *See*—
Woessner, Warren Dexter; Biddlecom, William Gerard; Arndt, Henry Clifford; Peruzzotti, George Peter; and Sih, Charles John, 4,066,834, Cl. 560-121.000.

Silbernagel, Bernard G.: *See*—
Rao, Bhaskara M. L.; and Silbernagel, Bernard G., 4,066,824, Cl. 429-50.000.

Silverzweig, Abraham: *See*—
Baker, Charles E.; and Silverzweig, Abraham, 4,066,319, Cl. 339-97.00R.

Simkin, Ariel: *See*—
Arcan, Mircea; Robin, Gordon; and Simkin, Ariel, 4,066,082, Cl. 128-303.00R.

Simonet, Guy: *See*—
Crooij, Pierre; and Simonet, Guy, 4,066,664, Cl. 260-332.20H.

Simpson, Terry Lee, to Atlantic Richfield Company. Mine roof support and method in longwall mining of thick mineral seams. 4,065,929, Cl. 61-45.00D.

Simpson, William I.: *See*—
Manasevit, Harold M.; and Simpson, William I., 4,066,481, Cl. 148-174.000.

Singer Company, The: *See*—
Jaffe, Wolfgang, 4,066,962, Cl. 324-208.000.
Klebe, Elmer C., Jr., 4,066,111, Cl. 145-4.000.
Mecklenborg, Richard A., 4,065,859, Cl. 35-12.00N.
Suchsland, Alfred R.; and Wilson, Terry L., 4,066,029, Cl. 112-158.00E.
Thornbery, James M.; and Orth, Charles D., 4,065,939, Cl. 62-217.000.

SKF Industrial Trading and Development Company B.V.: *See*—
Johnston, Gordon Boyd; Hillmann, Reinhart Michael; Kregler, Helmuth Martin; Janson, Bertil Sven; and Strandberg, Hasse Eivind, 4,066,304, Cl. 308-201.000.

Skinner, David R.; Jutus, Marvin W.; and Sowell, Miles L., to Standard Oil Company (Indiana). Hydraulic pumping unit with a variable speed triplex pump. 4,066,123, Cl. 166-68.500.

Skoglund, Klas Axel Lennart; and Backgard, Stig Gunnar Bengt, to Lagan Press AB. Mechanical safety device for the plunger in presses of the down-stroke or eccentric type. 4,066,013, Cl. 100-53.000.

Slack, James J.: *See*—
Mores, Lee R.; McCarthy, Justin P.; and Slack, James J., 4,066,789, Cl. 424-365.000.

SLEEVER Societe de droit francais (S.a.r.l.): *See*—
Fresnel, Jacques, 4,066,866, Cl. 219-388.000.

Smith, Darrell Franklin, Jr.; Clatworthy, Edward Frederick; and Wenschhof, Donald Edward, Jr., to Huntington Alloys, Inc. Low expansion superalloy. 4,066,447, Cl. 75-122.000.

Smith, Michael J.: *See*—
Przybyla, Franciszek J.; and Smith, Michael J., 4,066,822, Cl. 429-27.000.

Smith, Richard E.: *See*—
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,066,254, Cl. 271-236.000.

Smith, Richard M., to United States of America, Navy. Automatic thresholding and reference circuit. 4,067,013, Cl. 343-7.700.

Smith, Robert E.; Chytil, Frank S.; Feldstein, George; and Swartz, Dorman J., to Allied Chemical Corporation. Tail end grip mechanism. 4,066,217, Cl. 242-25.00R.

Smith, Robert L.: *See*—
Cragoe, Edward J., Jr.; Bicking, John B.; and Smith, Robert L., 4,066,675, Cl. 260-400.000.
Cragoe, Edward J., Jr.; Bicking, John B.; and Smith, Robert L., 4,066,692, Cl. 424-312.000.

Smith, Roy Henry; and McAllan, Alexander Baxter, to Astra Chemical Products AB. Lactosyl substituted ureides in ruminant feedstuff. 4,066,750, Cl. 424-180.000.

SmithKline Corporation: *See*—
Berges, David A., 4,066,761, Cl. 424-246.000.
Dunn, George Lawrence, 4,066,762, Cl. 424-246.000.

Smiths Industries Limited: *See*—
Barnard, Dominick Paul Edmund, 4,066,961, Cl. 324-163.000.
Jones, John W. D.; and Oakey, Keith R., 4,066,946, Cl. 318-685.000.

Snamprogetti, S.p.A.: *See*—
Faraci, Rocco; Rescalli, Carlo; and Catini, Stefano, 4,066,713, Cl. 260-677.00A.

Sneider, Vincent R. Disposable syringes. 4,066,080, Cl. 128-251.000.

Snyder, Robert P.: *See*—
Harwood, William James; and Snyder, Robert P., 4,065,886, Cl. 51-166.0FB.

Soberano, Mercedes E.: *See*—
Johnson, Alan J.; Soberano, Mercedes E.; Ong, Eng Bee; and Levy, Milton, 4,066,506, Cl. 195-66.00B.

Sociedad Espanola Del Acumulador Tudor S.A.: *See*—
Adderley, Edward, 4,066,418, Cl. 29-623.500.

Societa Italiana Resine S.I.R. S.p.A.: *See*—
Vargiu, Silvio; Paparatto, Piero; Passalenti, Beppino; and Parodi, Antonio, 4,066,606, Cl. 260-40.00R.

S.A. Etablissements Francois Salomon et Fils: *See*—
Salomon, Georges Pierre Joseph, 4,066,276, Cl. 280-605.000.

Societe Anonyme pour l'Equipment Electrique des Vehicules S.E.V. Marchal: *See*—
Guipaud, Serge, 4,066,968, Cl. 328-1.000.

Societe Cyberson: *See*—
Chovan, Stephan, 4,065,865, Cl. 40-444.000.

Societe Generale de Constructions Electriques et Mecaniques Alsthom: *See*—
Pham, Quang Minh; and Soffer, Jacques, 4,066,933, Cl. 318-60.000.

Soes, Lucas, to AMP Incorporated. Electrical connector assemblies. 4,066,327, Cl. 339-252.00R.

Soffer, Jacques: *See*—
Pham, Quang Minh; and Soffer, Jacques, 4,066,933, Cl. 318-60.000.

Sogelerg: *See*—
Oger, Jacques Francois, 4,065,932, Cl. 61-45.00R.

Soiron, Charles; and Keller, Karlheinz, to Ciba-Geigy Corporation. Process for dyeing or printing aromatic polyamide fibres. 4,066,395, Cl. 8-169.000.

Solartron Electronic Group Ltd., The: *See*—
Ley, Anthony John, 4,066,952, Cl. 324-83.00D.

Solomon, Arie. Long term storage apparatus. 4,066,401, Cl. 21-61.000.

Sonneville, Roger Paul. Spring rail clip with tightening limiting feature. 4,066,212, Cl. 238-349.000.

Southern Pacific Transportation Company: *See*—
Clements, Roy Milton, 4,066,299, Cl. 303-20.000.

Southwire Company: *See*—
Chia, E. Henry, 4,066,475, Cl. 148-3.000.
Peters, James W.; and Hardesty, Charles, 4,065,992, Cl. 83-285.000.

Sowell, Miles L.: *See*—
Skinner, David R.; Jutus, Marvin W.; and Sowell, Miles L., 4,066,123, Cl. 166-68.500.

Spanjersberg, Arie Adriaan, to De Staat der Nederlanden, to Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie. Method for recognizing characters. 4,066,999, Cl. 340-146.30S.

Spartanics, Ltd.: *See*—
Linton, John D.; Willits, Samuel P.; and Mohan, William L., 4,065,860, Cl. 35-25.000.

Spaulding, David Chantrill, to B. F. Goodrich Company, The. Flexible water absorbent polymer compositions comprising (A) unsaturated carboxylic acid, acrylic ester containing alkyl group 10-30 carbon atoms, additional monomer plus (B) aliphatic diol. 4,066,583, Cl. 260-17.4SG.

Speer, Billy Logan. Hem folding machine. 4,066,025, Cl. 112-121.290.

Speirs, Kenneth K.; and Bradley, Robert P., to Chromalloy American Corporation. Diffusion coating of ferrous metals. 4,066,806, Cl. 427-253.000.

Spence, Andrew P., to Atlantic Richfield Company. Process for the recovery of uranium. 4,066,297, Cl. 299-4.000.

Sperry Rand Corporation: *See*—
Derchak, Nicholas, 4,067,059, Cl. 364-200.000.
Godel, Siegfried; and Viola, James Joseph, 4,066,865, Cl. 219-370.000.
Matthews, Hugh B., 4,066,995, Cl. 340-18.0LD.
Waldrop, Thomas W.; and Flanagan, John R., 4,066,216, Cl. 241-190.000.

Spies, Klaus, to Bochumer Eisenhutte Heintzmann GmbH & Co. Mine roof support. 4,065,930, Cl. 61-45.00D.

Spina, John Jerome. Hanger radio. 4,066,967, Cl. 325-310.000.

Sprague Electric Company: *See*—
Maher, Galeb H., 4,066,426, Cl. 65-18.000.

Sprinzak, Yair, to Yeda Research & Development Co., Ltd. Esters of α-hydroperoxy-bis-p-halo-phenylacetic acids. 4,066,785, Cl. 424-308.000.

Sprowls, Joseph B., III, to Denver Fire Reporter & Protective Co., Inc. Multiplex interrogation system using pulses. 4,067,008, Cl. 340-409.000.

Srna, Richard Frank, to University of Delaware. Selective destruction of certain algae. 4,065,875, Cl. 47-1.400.

Stabilus GmbH: *See*—
Kaptanis, Panoyotis, 4,066,279, Cl. 280-711.000.

Stacey, Gilbert Joseph: *See*—
Brittain, David Robert; Brown, Edward Douglas; Hepworth, Walter; and Stacey, Gilbert Joseph, 4,066,651, Cl. 260-287.00K.

Stadler, Klaus: *See*—
Helmberger, Josef; and Stadler, Klaus, 4,066,355, Cl. 355-38.000.

Stafford, George C., Jr.: *See*—
Hunt, Donald F.; and Stafford, George C., Jr., 4,066,894, Cl. 250-292.000.

Stahl, Hermann: *See*—
Eckle, Otto; and Stahl, Hermann, 4,066,376, Cl. 407-101.000.

Stamicarbon, N.V.: *See*—
Venderbos, Dirk J., 4,066,693, Cl. 260-555.00A.

Stampe, Richard Herbert, to Deere & Company. Fuel injection nozzle assembly. 4,066,213, Cl. 239-533.300.

Standard Alliance Industries Inc.: *See*—
Trumbull, Douglas, 4,066,256, Cl. 272-18.000.

Standard Oil Company, The: *See*—
Li, George S.; and Rosen, Irving, 4,066,717, Cl. 260-874.000.

Standard Oil Company (Indiana): *See—*
Czajka, Thomas S.; and Needham, Richard P., 4,066,593, Cl. 260-29.20E.
Feinstein, Allen; and Fields, Ellis K., 4,066,622, Cl. 260-47.0CP.
Patchett, Jay G.; and Hadley, Charles F., 4,066,994, Cl. 340-18.0NC.
Skinner, David R.; Jutus, Marvin W.; and Sowell, Miles L., 4,066,123, Cl. 166-68.500.
Wang, Chen-Shen, 4,066,604, Cl. 260-37.00R.

Stanford Research Institute: *See—*
Karp, Arthur, 4,066,988, Cl. 333-82.00B.
Taenzer, Jon C.; and Johnson, Steven H., 4,065,976, Cl. 73-633.000.

Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., to Xerox Corporation. Three-way pneumatic registration apparatus. 4,066,254, Cl. 271-236.000.

Stanley, William Joseph, to 234966 Wholesale Ltd. Stamp stock sheet. 4,065,864, Cl. 40-405.000.

Stanley Works: *See—*
Suska, Charles R., 4,066,857, Cl. 200-61.700.

Stark, Walter, to Multorgan S.A. Method and apparatus for electro shock degermination of water. 4,066,544, Cl. 210-64.000.

Staroska, John T.: *See—*
Hanna, Ward T.; Drennan, John J.; and Staroska, John T., 4,066,167, Cl. 206-627.000.

Starratt, Medford L., Jr. Molded boat hulls. 4,065,820, Cl. 9-6.00P.

State of Israel Ministry of Commerce and Industry, The: *See—*
Lewin, Menachem; and Guttmann, Hilda, 4,066,387, Cl. 8-4.000.

Staunton, John J. J., to Perkin-Elmer Corporation, The. Temperature control apparatus. 4,066,365, Cl. 356-244.000.

Stedman, Robert N., to Caterpillar Tractor Co. Rotatable radiator assembly for a vehicle. 4,066,119, Cl. 165-41.000.

Steel Engineering Company, The: *See—*
Wallace, Trevor Evelyn, 4,066,135, Cl. 173-44.000.

Steiner, Edwin C.: *See—*
Dorman, Linneaus C.; and Steiner, Edwin C., 4,066,684, Cl. 260-112.50R.

Steinmetz, Anthony, to U.S. Philips Corporation. Mercury wettable contact assembly. 4,066,859, Cl. 200-263.000.

Stephens, Charles R., Jr.: *See—*
Blackwood, Robert K.; and Stephens, Charles R., Jr., 4,066,694, Cl. 260-559.0AT.

Stephens, Gerald D., to Valor Enterprises, Inc. Solderless coaxial cable terminator. 4,066,324, Cl. 339-126.00J.

Stephenson, Robert L., to Allied Chemical Corporation. Safety belt buckle. 4,065,836, Cl. 24-230.00A.

Sterling Drug Inc.: *See—*
Crounse, Nathan N.; and Ambrosiano, Nicholas A., 4,066,653, Cl. 260-293.610.

Stern, David, to Martin Paint & Chemical Corporation. Aerosol dispensed latex paint and package containing the same. 4,066,596, Cl. 260-29.60R.

Stern, Emanuel, to Dynek Corporation. Portable water filtration device. 4,066,551, Cl. 210-282.000.

Stern, Ernest; and Ingebrigtsen, Kjell A. Surface acoustic wave devices for processing and storing signals. 4,066,984, Cl. 333-30.00R.

Sternberg, Moshe M.: *See—*
Cornelius, Dennis Alfred; Eberts, Nancy Jane; and Sternberg, Moshe M., 4,066,799, Cl. 426-534.000.

Stevens, Peter; and Deuber, John M., to Oxy Metal Industries Corporation. Electrodeposition of palladium. 4,066,517, Cl. 204-43.00N.

Stevenson, Arzella F. Photocopy machine. 4,066,358, Cl. 355-75.000.

Stewart, Marvin L. Multi-layered archery target. 4,066,261, Cl. 273-102.00B.

Stiefel, Arthur A. Game target for projectiles. 4,066,262, Cl. 273-105.00R.

Stiles, Walter J.: *See—*
Salisbury, Winfield W.; and Stiles, Walter J., 4,066,138, Cl. 175-16.000.

Stitch, Richard C., to General Electric Company. Combination drain sump and air pressure chamber for automatic clothes washing machine. 4,066,094, Cl. 137-387.000.

Stoger, Klaus; Dotzer, Richard; and Gehring, Johann, to Siemens Aktiengesellschaft. Apparatus and method for the electrodepositing of aluminum. 4,066,515, Cl. 204-14.00N.

Storey, Dale A. Lock for rifle. 4,065,867, Cl. 42-69.00R.

Stork-Werkspoor Sugar B.V.: *See—*
Hoks, Dirk, 4,066,547, Cl. 210-78.000.

Strandberg, Hasse Eivind: *See—*
Johnston, Gordon Boyd; Hillmann, Reinhart Michael; Kregler, Helmuth Martin; Janson, Bertil Sven; and Strandberg, Hasse Eivind, 4,066,304, Cl. 308-201.000.

Strauss, Werner, to Klockner-Humboldt-Deutz Aktiengesellschaft. Method and apparatus for the classification of fine material from a stream of material in a circulating air classifier. 4,066,535, Cl. 209-139.00A.

Streit, James L. Musical instrument support stand. 4,065,994, Cl. 84-453.000.

Streit, Werner: *See—*
Scharf, Emil; Fikentscher, Rolf; Auhorn, Werner; and Streit, Werner, 4,066,494, Cl. 162-164.0EP.

Strohl, Klaus D., to ITT Industries, Incorporated. Oscillator circuit comprising integrated MIS field-effect transistors. 4,066,982, Cl. 331-111.000.

Strom, Rolf; Heikkila, Veikko; and Hakkinen, Leo, to Oy Tampella AB. Device for changing bore crowns. 4,065,845, Cl. 29-283.000.

Struck, Leslie G., to Chicago Fittings Corporation. High pressure insulated coupling. 4,066,283, Cl. 285-53.000.

Strycker, Stanley J., to Dow Chemical Company, The. Substituted phenoxyalkyl quaternary ammonium compounds as antiarrhythemic agents. 4,066,771, Cl. 424-267.000.

Stuckert, Paul E., to International Business Machines Corporation. Mask-exposure scheme. 4,066,458, Cl. 96-41.000.

Stuckler, Peter: *See—*
Woltron, Klaus; and Stuckler, Peter, 4,066,500, Cl. 176-78.000.

Studer, Rolf: *See—*
Gillessen, Dieter; Studer, Rolf; and Trzeciak, Arnold, 4,066,635, Cl. 260-112.50R.

Suchsland, Alfred R.; and Wilson, Terry L., to Singer Company, The. Electromechanical remote cam selector for sewing machines. 4,066,029, Cl. 112-158.00E.

Suggitt, Robert M.; Coone, Joseph H., Jr.; and Gates, Walter C., Jr., to Texaco Inc. Process for the hydrogenation of nitrated paraffins using a palladium on carbon catalyst characterized by a low ash and a low halide content. 4,066,699, Cl. 260-583.00R.

Sugito, Yoshifumi: *See—*
Horiguchi, Shojiro; Nakamura, Michiei; and Sugito, Yoshifumi, 4,066,462, Cl. 106-14.000.

Suketomo, Toshitaka: *See—*
Umeda, Haruhiko; Ito, Hiroshi; and Suketomo, Toshitaka, 4,066,143, Cl. 180-77.00S.

Sullivan, Greig E.: *See—*
Walters, Chester H.; Barmeier, Harold J., Jr.; and Sullivan, Greig E., 4,066,545, Cl. 210-71.000.

Sullivan, Joseph A.: *See—*
Gallani, Zvi; and Sullivan, Joseph A., 4,066,983, Cl. 331-117.00R.

Sumitomo Chemical Company, Limited: *See—*
Komiyama, Yoshiki; Yamamoto, Seiya; and Yasumasa, Yoshiaki, 4,066,402, Cl. 23-230.0PC.
Saito, Shinichi; Okaue, Asaya; Baba, Kazuo; and Tanaka, Shigeo, 4,066,718, Cl. 260-878.00B.
Shintani, Tsutomu; Ozeki, Azuhiro; Kunihiro, Haruo; and Shigehiro, Kosuke, 4,066,703, Cl. 260-592.000.

Sumitomo Durez Company, Ltd.: *See—*
Funabiki, Kyohei; Matsushima, Noriaki; Tachikawa, Toshiyuki; and Ikeda, Kazuichi, 4,066,588, Cl. 260-22.0TN.

Sumiyoshi, Masaharu: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,066,043, Cl. 123-3.000.

Summa, Frank A., to Electrides Corporation. Energizing circuits for fluorescent lamps. 4,066,930, Cl. 315-209.00R.

Sun-Econ, Inc.: *See—*
Jonsson, Kjartan A., 4,065,938, Cl. 62-160.000.

Sunagawa, Yoshihiko, to Tokyo Keiso Kabushiki Kaisha. Liquid level measuring apparatus. 4,065,968, Cl. 73-313.000.

Sunday, Brooks R.: *See—*
Schwender, Charles F.; and Sunday, Brooks R., 4,066,767, Cl. 424-251.000.

Sundermann, Rudolf; Rottloff, Gunther; and Grigat, Ernst, to Bayer Aktiengesellschaft. High molecular weight polytriazines of soluble polymeric N-cyano-isourea ethers. 4,066,577, Cl. 260-2.00R.

Sundstrand Corporation: *See—*
Caine, Gerard H., 4,066,552, Cl. 210-304.000.

Sunfresh Products: *See—*
Nelson, Lawrence B.; Mott, Stuart A.; and Flugger, Ray T., 4,065,857, Cl. 34-30.000.

Suomen Sokeri Osakeyhtio (Finnish Sugar Company): *See—*
Melaja, Asko J.; Virtanen, Jouko J.; and Heikkila, Heikki O., 4,066,711, Cl. 260-637.00R.

Superior Electric Company, The: *See—*
Leenhouts, Albert C., 4,066,944, Cl. 318-571.000.

Sury, Yel S.; and Lignos, James M., to Ciba-Geigy Corporation. Process for the production of thiophosphoric acid esters. 4,066,642, Cl. 260-251.00P.

Susi, Peter Vincent: *See—*
Oppelt, John Christian; and Susi, Peter Vincent, 4,066,614, Cl. 260-45.8NZ.

Suska, Charles R., to Stanley Works. Switch activating hinge having reciprocating cam follower switch actuator. 4,066,857, Cl. 200-61.700.

Sutcliffe Engineering Holdings Limited, The: *See—*
Yates, Victor Horace, 4,066,258, Cl. 272-85.000.

Suthers, Charles E., to General Electric Company. High voltage transformer winding assembly with multiple frequency tuning. 4,066,955, Cl. 363-68.000.

Suzaki, Kuniyoshi: *See—*
Takahashi, Kiyoshi; Takimoto, Hiroyuki; Yamada, Takashi; Itani, Takashi; Ashida, Akira; and Suzaki, Kuniyoshi, 4,066,963, Cl. 352-12.000.

Suzuki, Akira: *See—*
Yukuta, Toshio; Ohashi, Takashi; Kojima, Minoru; Suzuki, Akira; and Taniguchi, Yoshiko, 4,066,579, Cl. 260-2.5AP.

Suzuki, Kazuyoshi: *See—*
Kawase, Shoji; Kuratsuji, Takatoshi; Inata, Hiroo; Suzuki, Kazuyoshi; and Shima, Takeo, 4,066,624, Cl. 260-49.000.

Suzuki, Takao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine provided with precombustion chamber. 4,066,045, Cl. 123-30.00D.

Svensk Tryckgjuntning SH AB: *See—*
Hjelte, Sven Roland; and Eksell, Lennart, 4,066,222, Cl. 242-107.40B.

Svensson, Sven-Hakan: *See—*
Hultgren, Karl Sten Rudolf; and Svensson, Sven-Hakan, 4,065,999, Cl. 89-36.00H.
Swanson, Harold V.; and Forero, Jorge E., to Interpace Corporation. Slotted flange connector useable in a method for replacing an existing utility pole without disturbing hardware mounted thereon. 4,066,372, Cl. 403-302.000.
Swartz, Dorman J.: *See—*
Smith, Robert E.; Chytil, Frank S.; Feldstein, George; and Swartz, Dorman J., 4,066,217, Cl. 242-25.00R.
Swift & Company: *See—*
Connick, Francis G.; and Bernholdt, Harry F., 4,066,790, Cl. 426-8.000.
Swift, David Merton, to Lawrence Systems, Inc. Transmissivity-coded data card systems. 4,066,910, Cl. 250-555.000.
Swiss Aluminium Ltd.: *See—*
Gullotti, Damian V.; Fayard, William S.; and Wedgeworth, Wiley W., 4,066,476, Cl. 148-11.50A.
Gullotti, Damian V.; Fayard, William S.; and Wedgeworth, Wiley W., 4,066,480, Cl. 148-11.50A.
SWS Silicones Corporation: *See—*
Lewis, Richard N.; and Martin, Eugene R., 4,066,680, Cl. 260-448.20E.
Sybron Corporation: *See—*
Ackerman, Thomas Liddon; Barbato, Mathew Martin; and Vidmantas, Eugene, 4,065,965, Cl. 73-194.0EM.
Syeles, Albert M.: *See—*
Anderson, Wallace E.; Syeles, Albert M.; and Krall, Albert D., 4,066,819, Cl. 428-472.000.
Syntex (U.S.A.) Inc.: *See—*
Ackrell, Jack, 4,066,663, Cl. 260-327.00B.
Szeberenyi, Szabolcs: *See—*
Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcs, 4,066,709, Cl. 260-618.00B.
Szporny, Laszlo: *See—*
Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcs, 4,066,709, Cl. 260-618.00B.
T.A.D.: *See—*
Darwood, James R., 4,066,848, Cl. 179-84.00R.
Tachikawa, Toshiyuki: *See—*
Funabiki, Kyohei; Matsushima, Noriaki; Tachikawa, Toshiyuki; and Ikeda, Kazuichi, 4,066,588, Cl. 260-22.0TN.
Tada, Norio: *See—*
Oka, Yoshikazu; Miyake, Akio; Tada, Norio; and Itoh, Katsumi, 4,066,648, Cl. 260-268.0TR.
Taddeo, Fausto V.; and Pauly, Raymond W., to Pacific Electronic Enterprises Inc. DC to AC switching converter. 4,067,057, Cl. 363-41.000.
Taenzer, Jon C.; and Johnson, Steven H., to Stanford Research Institute. Mechanical scanning method and apparatus for ultrasonic imaging, or the like. 4,065,976, Cl. 73-633.000.
Taga, Yutaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Oil pressure control system for an automatic transmission system. 4,065,985, Cl. 74-869.000.
Takada, Juichiro, to Takata Kojyo Co., Ltd. Automatic locking safety belt retractor device. 4,066,223, Cl. 242-107.40A.
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Sakamoto, Masakatsu; Watanabe, Syosaku; Karino, Takafumi; Yazu, Junichi; Takashima, Kouichi; Miyashiro, Hiroshi; Takagi, Takeo; and Konno, Takao, 4,066,298, Cl. 302-2.00R.
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Igarashi, Shunkichi; Okano, Takeshi; Takahama, Sho; and Hakamata, Yoshio, 4,066,354, Cl. 355-28.000.
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Ohtani, Iwao; and Takahashi, Hashime, 4,066,115, Cl. 164-9.000.
Takahashi, Kiyoshi; Takimoto, Hiroyuki; Yamada, Takashi; Itani, Takashi; Ashida, Akira; and Suzaki, Kuniyoshi, to Canon Kabushiki Kaisha. Synchronization system of the cine-projector with the sound tape reproducer. 4,066,963, Cl. 352-12.000.
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Shimazoe, Michitaka; Nakamura, Kousuke; Matsushita, Yasuo; Shimada, Satoshi; Yamada, Kazuji; and Takahashi, Yukio, 4,065,971, Cl. 73-727.000.
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Nakatani, Hirokuni; Takamura, Toru; Hiroshima, Yoshimitsu; and Hashimoto, Susumu, 4,067,046, Cl. 358-213.000.
Takano, Katsuyoshi; Matsumoto, Masafumi; and Orikasa, Kimihiko, to Toko, Inc. Trapped energy piezoelectric filter. 4,066,986, Cl. 333-72.000.
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Naito, Hirokuni; Yoshimura, Isao; Takao, Norito; and Kawame, Yasuta, 4,066,811, Cl. 428-220.000.
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Takata Kojyo Co., Ltd.: *See—*
Takada, Juichiro, 4,066,223, Cl. 242-107.40A.
Takeda Chemical Industries, Ltd.: *See—*
Oka, Yoshikazu; Miyake, Akio; Tada, Norio; and Itoh, Katsumi, 4,066,648, Cl. 260-268.0TR.
Takenaka Komuten Company, Ltd.: *See—*
Katayama, Ichiro, 4,065,933, Cl. 61-50.000.
Takagi, Atsushi; Kuroiwa, Hiroyuki; Miyaguchi, Masao; and Kawamura, Tateo, 4,065,928, Cl. 61-36.00R.
Takeuchi, Kouichi: *See—*
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Takeuchi, Masaharu; Igarashi, Isemi; and Bunda, Tsuchio, to Kabushiki Kaisha Toyota Cho Kenkyusho. Metal body having large surface area and process for producing same. 4,066,450, Cl. 75-229.000.
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Takigawa, Tomoshi: *See—*
Toyama, Masamichi; Takigawa, Tomoshi; Hirata, Noritsugu; and Ishikawa, Kazuo, 4,066,346, Cl. 352-72.000.
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Takahashi, Kiyoshi; Takimoto, Hiroyuki; Yamada, Takashi; Itani, Takashi; Ashida, Akira; and Suzaki, Kuniyoshi, 4,066,963, Cl. 352-12.000.
Talapatra, Dipak Chandra. Light-weight arch type structures for large reflective mirrors. 4,066,344, Cl. 350-310.000.
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Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tonomura, Shinji; Tamao, Yoshikuni; Tezuka, Tohru; and Hijikata, Akiko, 4,066,758, Cl. 424-244.000.
Tamao, Yoshikuno: *See—*
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Tamm, Paul W., to Chevron Research Company. Hydrocarbon hydrotreating catalyst composition. 4,066,574, Cl. 252-439.000.
Tan, Gene S. T., to Hexcel Corporation. Cable pressure block forming kit and valve apparatus. 4,066,486, Cl. 156-48.000.
Tanaka, Kunio: *See—*
Yoshikawa, Ryoichi; Oda, Teruhisa; Tanaka, Kunio; Iura, Yukio; Fukushima, Tadahide; and Aizawa, Hiroshi, 4,067,032, Cl. 354-288.000.
Tanaka, Masaaki: *See—*
Nohira, Hidetaka; Kobashi, Kiyoshi; and Tanaka, Masaaki, 4,066,056, Cl. 123-119.00A.
Tanaka, Shigeo: *See—*
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Tanaka, Taro: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,066,043, Cl. 123-3.000.
Tanaka, Yukiyasu: *See—*
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Tandrup, Niels, to Danfoss A/S. Hydraulic regulator. 4,066,102, Cl. 137-625.640.
Tandrup, Niels, to Danfoss A/S. Hydraulic regulator. 4,066,103, Cl. 137-625.640.
Tanida, Hiroshi: *See—*
Hamashima, Yoshio; Yoshioka, Mitsuru; Tanida, Hiroshi; Tsuji, Teruji; Narisada, Masayuki; Komeno, Taichiro; and Nagata, Wataru, 4,066,641, Cl. 544-17.000.
Taniguchi, Yoshiko: *See—*
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Tanuma, Tuneo; and Yoshida, Teruo, to Hitachi Chemical Company, Ltd. Polyester-modified vinyl polymer and production method thereof. 4,066,586, Cl. 260-22.0CB.
Tao, Masato: *See—*
Mohri, Yoshio; Hiroishi, Takashi; Sano, Kinzi; Huruya, Koichi; Muramoto, Tadashi; and Tao, Masato, 4,066,465, Cl. 106-50.000.
Taylor, Allen L.; and Sheffield, William F., to Minnesota Mining and Manufacturing Company. Poling machine for continuous film of pyroelectric and/or piezoelectric material. 4,067,056, Cl. 361-233.000.
Taylor, David Alexander: *See—*
Moore, Alexander Joseph; Taylor, David Alexander; and Greene, David James, 4,066,987, Cl. 333-95.00R.
Taylor, Peter; and Considine, Brian. Support systems. 4,065,904, Cl. 52-731.000.
Taylor, Robert L., to International Telephone and Telegraph Corporation. Multiple light intensity flash unit. 4,066,884, Cl. 362-16.000.

Taylor Woodrow Construction Limited: *See—*
Burrow, Reginald Edward Dowton; and Plaskitt, David Edmund, 4,065,935, Cl. 61-95.000.
TECHNICO Development and Financing S.A.: *See—*
Mehnert, Walter, 4,066,019, Cl. 102-70.20R.
Technicon Instruments Corporation: *See—*
Gordon, Abraham, 4,065,973, Cl. 73-423.00A.
TED Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec: *See—*
Borchard, Heinz; Grottker, Gunter; and Thun, Peter, 4,066,268, Cl. 274-42.00R.
Teijin Limited: *See—*
Kawase, Shoji; Kuratsuji, Takatoshi; Inata, Hiroo; Suzuki, Kazuyoshi; and Shima, Takeo, 4,066,624, Cl. 260-49.000.
Temple University: *See—*
Labes, Mortimer M., 4,066,567, Cl. 252-299.000.
Tennessee Valley Authority: *See—*
Jones, Thomas M., 4,066,432, Cl. 71-34.000.
Tenquist, David A., to Novus Inc. Window drip collector. 4,065,884, Cl. 52-37.000.
Teodorescu, Gheorghe Marcel; and Popa, Aurel, to Institutul National Pentru Creatie Stintifica si Tehnica - Increst. Internal combustion engine having a variable engine displacement. 4,066,049, Cl. 123-48.00R.
Terando, Norman H.: *See—*
Jones, Reuben G.; and Terando, Norman H., 4,066,776, Cl. 424-270.000.
Terauchi, Yoshiaki: *See—*
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Terradex Corporation: *See—*
Holub, Fred F.; and Alter, H. Ward, 4,065,972, Cl. 73-421.50R.
Teti, John J.: *See—*
Miller, Raymond M.; and Teti, John J., 4,066,878, Cl. 364-724.000.
Tetzlaff, Karl-Heinz. Gamma irradiation plant. 4,066,907, Cl. 250-453.000.
Texaco Development Corporation: *See—*
Schulze, Heinz, 4,066,649, Cl. 260-268.0SY.
Texaco Inc.: *See—*
Carlin, Joseph T.; Ware, James W.; Mills, Melvin E., Jr.; and Wells, John A., 4,066,124, Cl. 166-252.000.
Harnsberger, Bobby G., 4,066,127, Cl. 166-278.000.
Herbstman, Sheldon; Webb, Allen N.; and Estes, John H., 4,066,716, Cl. 260-683.470.
Mayer, Edward A.; and Nolting, Jerry L., 4,066,059, Cl. 123-32.0SA.
McCoy, Drew E., 4,066,543, Cl. 210-63.00R.
Suggitt, Robert M.; Coone, Joseph H., Jr.; and Gates, Walter C., Jr., 4,066,699, Cl. 260-583.00R.
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Texas Instruments Incorporated: *See—*
Brandstaetter, David Peter; and Harris, James Marion, 4,067,058, Cl. 364-200.000.
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Shaw, Don W., 4,066,482, Cl. 148-175.000.
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Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,066,773, Cl. 424-267.000.
Thaeler, Leigh M.: *See—*
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Thermo Electron Corporation: *See—*
Fine, David H., 4,066,409, Cl. 23-230.0PC.
Fine, David H.; Fronduto, John J.; and Rounbehler, David P., 4,066,411, Cl. 23-253.0PC.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile track tamping and track position correction machine. 4,066,020, Cl. 104-7.00B.
Thibodeau, Leo Thomas. Water conducting members spaced between spaced exposed building support beams. 4,065,883, Cl. 52-11.000.
Thiede, Horst: *See—*
Kummer, Franz; Mai, Gerhard; Ruthardt, Rolf; and Thiede, Horst, 4,065,851, Cl. 29-630.00R.
Thilly, William G., to Massachusetts Institute of Technology. Assay for mutagenesis in diploid human lymphoblasts. 4,066,510, Cl. 195-103.50R.
Thomas, Bobby J.. *See—*
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Thompson, Wilmer B. Splicing tape assembly and dispenser therefor. 4,066,185, Cl. 221-26.000.
Thomson-CSF: *See—*
Diamand, Felix; Bourrabier, Guy; and Antoine, Robert, 4,066,979, Cl. 331-56.000.
Thor Power Tool Company: *See—*
Bardwell, Francis G.; and Dudek, Edmund C., 4,066,942, Cl. 318-434.000.
Thornbery, James M.; and Orth, Charles D., to Singer Company, The. Combination valve. 4,065,939, Cl. 62-217.000.
Thun, Peter: *See—*
Borchard, Heinz; Grottker, Gunter; and Thun, Peter, 4,066,268, Cl. 274-42.00R.
Tillander, Hans. Blood emptying device. 4,066,084, Cl. 128-327.000.
Tilley, Jefferson Wright: *See—*
Cohen, Michael Robert; Kierstead, Richard Wightman; and Tilley, Jefferson Wright, 4,066,695, Cl. 260-564.00E.
Tippmann, Eugene R. Method of building-up a layer of metal on a metal surface. 4,066,862, Cl. 219-76.140.
Tison, Eric, to Ateliers de Constructions Mecaniques Seailles & Tison. Printer with intermittant variable web feed. 4,066,016, Cl. 101-228.000.
Tkach, Grigory Anatolievich: *See—*
Panov, Vadim Ivanovich; Tkach, Grigory Anatolievich; Tomenko, Viktor Mikhailovich; Zolotukhin, Boris Mikhailovich; and Belyaev, Erik Konstantinovich, 4,066,416, Cl. 23-283.000.
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Takano, Katsuyoshi; Matsumoto, Masafumi; and Orikasa, Kimihiko, 4,066,986, Cl. 333-72.000.
Tokyo Keiso Kabushiki Kaisha: *See—*
Sunagawa, Yoshihiko, 4,065,968, Cl. 73-313.000.
Tokyo Sanyo Electric Co. Ltd.: *See—*
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Goto, Eizo, 4,066,427, Cl. 65-40.000.
Tomczak, Lawrence William: *See—*
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Sato, Ryuichi; Ishikawa, Akira; Ishida, Yukihito; Sato, Hiroshi; Tomisawa, Setsuo; Toyoshima, Shigeshi; and Ikegami, Shiro, 4,066,678, Cl. 260-429.00R.
Tomlinson, Kenneth; and Harrison, Michael, to Colgate-Palmolive Company. Dentifrice. 4,066,745, Cl. 424-49.000.
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Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,066,759, Cl. 424-244.000.
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Tosaka, Osamu; Morioka, Hajimu; Hirakawa, Hayao; Ishii, Kenji; Kubota, Koji; and Hirose, Yoshio, to Ajinomoto Co., Inc. Method for producing L-lysine by fermentation. 4,066,501, Cl. 195-29.000.
Toshin Science Co., Ltd.: *See—*
Sasaki, Jiro, 4,066,546, Cl. 210-75.000.
Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcs, to Richter Gedeon Vegyeszeti Gyar Rt. α-Ethyny benzhydrols. 4,066,709, Cl. 260-618.00B.
Toyama, Masamichi; Takigawa, Tomoshi; Hirata, Noritsugu; and Ishikawa, Kazuo, to Canon Kabushiki Kaisha. Motion picture camera with a built in color conversion filter. 4,066,346, Cl. 352-72.000.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Kosaka, Yujiro; Uemura, Masaru; Kuroki, Hitoshi; Otomo, Kanji; Terauchi, Yoshiaki; and Arai, Yasuo, 4,066,810, Cl. 428-195.000.
Seita, Toru; Shimizu, Akihiko; and Kosaka, Yujiro, 4,066,827, Cl. 526-50.000.
Toyoaki, Ueno; Seizo, Takayama; Kiyoshi, Hashimoto; and Masashi, Uchida, to Ube Industries, Ltd. Apparatus for controlled injection of a molten material under pressure. 4,066,189, Cl. 222-334.000.
Toyomoto, Hiromitsu. Automatic lubricating device for remotely operable bowden cable. 4,066,147, Cl. 184-15.00R.
Toyoshima, Shigeshi: *See—*
Sato, Ryuichi; Ishikawa, Akira; Ishida, Yukihito; Sato, Hiroshi; Tomisawa, Setsuo; Toyoshima, Shigeshi; and Ikegami, Shiro, 4,066,678, Cl. 260-429.00R.

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Segawa, Yoshihiro; Sato, Susumu; Yasuda, Eturo; Hattori, Tadashi; and Aoki, Keiji, 4,066,413, Cl. 23-254.00E.
Suzuki, Takao, 4,066,045, Cl. 123-30.00D.
Taga, Yutaka, 4,065,985, Cl. 74-869.000.
Tranquilla, Michael N.: *See—*
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Trattner, Hermann; Saatze, Kuno; and Bauereiss, Adolf, to Siemens Aktiengesellschaft. Variable load, high vacuum shaft bearing test apparatus. 4,065,956, Cl. 73-9.000.
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Travis, Calvin C. Electrically powered outboard motor means. 4,066,032, Cl. 115-18.00E.
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Nieman, Charles Wayne; Turkovich, Robert Peter; and Castronovo, Robert Frank, 4,066,187, Cl. 222-57.000.
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Tsugane, Sachio. Automatic door opening and shutting device. 4,065,878, Cl. 49-360.000.
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Tsukamoto, Hidehiko; and Maeda, Nobutaka, to Mitsubishi Jukogyo Kabushiki Kaisha. Roll-forming dies in a cross-rolling machine. 4,065,948, Cl. 72-108.000.
Tsuzuki, Naobumi; Anazawa, Shinzo; and Noguchi, Shozo, to Nippon Electric Company, Ltd. Semiconductor device. 4,067,040, Cl. 357-74.000.
Turkovich, Robert Peter: *See—*
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Uchida, Akinari: *See—*
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Uchida, Kuniki; Araki, Kenzi; Fukunaka, Shiro; and Kurihara, Takao, to Nippon Kokan Kabushiki Kaisha. Method of making high strength cold reduced steel by continuous annealing process. 4,066,474, Cl. 148-2.000.
Ueda, Chiaki: *See—*
Nohmi, Makoto; Fujikura, Nobuyuki; Ueda, Chiaki; and Toyota, Eiichi, 4,066,230, Cl. 246-182.00B.
Uemura, Masaru: *See—*
Kosaka, Yujiro; Uemura, Masaru; Kuroki, Hitoshi; Otomo, Kanji; Terauchi, Yoshiaki; and Arai, Yasuo, 4,066,810, Cl. 428-195.000.
Ukigai, Toshiyuki: *See—*
Isa, Hiroshi; Ukigai, Toshiyuki; Tominaga, Anri; and Sato, Michito, 4,066,715, Cl. 260-683.15B.
Umeda, Haruhiko; Ito, Hiroshi; and Suketomo, Toshitaka, to Kabushiki Kaisha Komatsu Seisakusho. Vehicle with rotating cab. 4,066,143, Cl. 180-77.00S.
Umetsu, Junji: *See—*
Urano, Fumio; and Umetsu, Junji, 4,067,033, Cl. 354-289.000.
Umezawa, Hamao: *See—*
Takagi, Kenkichi; Yamamoto, Yukio; Yamazaki, Tadao; Yamaguchi, Hiroshi; and Umezawa, Hamao, 4,066,507, Cl. 195-80.00R.
Unelec S.A.: *See—*
Hennemann, Jean; and Daussin, Bernard, 4,066,922, Cl. 310-80.000.
Unicon Parking Structures, Inc.: *See—*
Rice, Edward K., 4,065,907, Cl. 52-747.000.
Union Carbide Corporation: *See—*
Babian, Gunther William; and Harris, Edward Bruce, 4,066,582, Cl. 260-17.00A.
D'Silva, Themistocles D. J., 4,066,689, Cl. 260-544.00C.
Pietruszewski, John Joseph; Scaccia, Carl; and Wagner, Ralph James, 4,066,722, Cl. 261-87.000.
United Kingdom Atomic Energy Authority: *See—*
Green, Derek, deceased; and Green, Muriel Irene, executrix, 4,065,950, Cl. 72-191.000.
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Agriculture: *See—*
Kanda, Hiroshi; Wang, Hwa L.; and Hesseltine, Clifford W., 4,066,792, Cl. 426-41.000.
Army: *See—*
Hamilton, Charles W.; and Kleider, Alfred, 4,066,890, Cl. 250-199.000.
Rocha, John G., 4,065,998, Cl. 89-11.000.
Energy Research and Development Administration: *See—*
Brown, Robert L., 4,066,496, Cl. 176-3.000.
Lewandowski, Edward F.; and Anderson, Petrus A., 4,065,853, Cl. 30-361.000.
Health, Education and Welfare: *See—*
Henkin, Robert I., 4,066,405, Cl. 23-230.00B.
Johnson, Alan J.; Soberano, Mercedes E.; Ong, Eng Bee; and Levy, Milton, 4,066,506, Cl. 195-66.00B.
Interior: *See—*
Buller, Paul L.; Chapman, William L.; Thomas, Bobby J.; and Fowler, James C., 4,066,992, Cl. 340-15.5MC.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Zebus, Paul P.; and Packer, Poley N. Adjustable securing base. 4,066,039, Cl. 118-500.000.
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Mogavero, Louis N.; Johnson, Edwin G.; Evans, John M., Jr; and Albus, James S., 4,067,015, Cl. 343-225.000.
Perry, William E., 4,067,043, Cl. 358-55.000.
Navy: *See—*
Anderson, Wallace E.; Syeles, Albert M.; and Krall, Albert D., 4,066,819, Cl. 428-472.000.
Kaloi, Cyril M., 4,067,016, Cl. 343-700.0MS.
Liggett, Thomas, 4,066,736, Cl. 423-386.000.
Nebel, Otto T.; Trujillo, Louis J.; and Russell, Carl C., 4,067,025, Cl. 354-62.000.
Nielsen, Arnold T., 4,066,833, Cl. 548-356.000.
Nycum, James M., 4,066,234, Cl. 248-358.00R.
Schultz, Leonard J.; Hamori, Alfred Steven; and Rosen, Robert, 4,066,965, Cl. 325-120.000.
Smith, Richard M., 4,067,013, Cl. 343-7.700.
U.S. Philips Corporation: *See—*
Buzzi, Leo; and Malobabic, Peter, 4,065,977, Cl. 74-49.000.
Rottier, Jacob, 4,066,932, Cl. 315-244.000.
Steinmetz, Anthony, 4,066,859, Cl. 200-263.000.
Van Besouw, Joannes Baptista Maria Adrianus; Gotje, Egbert Bernardus Gretinus Willem; and Kerstens, Franciscus Napoleon Adrianus, 4,066,928, Cl. 315-39.510.
van Esdonk, Johannes, 4,066,923, Cl. 313-402.000.
United Technologies Corporation: *See—*
Howard, Curtiss Gilmore, 4,066,377, Cl. 408-1.00R.
Universal Oil Products Company: *See—*
Hoyer, William A.; Johnson, Lowell W.; and Schoenenberger, Richard J., 4,066,801, Cl. 427-8.000.
University of Delaware: *See—*
Srna, Richard Frank, 4,065,875, Cl. 47-1.400.
University of Minnesota, The Regents of the: *See—*
Rosenau, John R.; and Anderson, John C., 4,066,800, Cl. 426-582.000.
University of Virginia: *See—*
Hunt, Donald F.; and Stafford, George C., Jr., 4,066,894, Cl. 250-292.000.
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; Mita, Kunio; Kawasaki, Masahiro; and Mori, Chiharu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Shutter speed digital display device for cameras. 4,067,023, Cl. 354-23.00D.
UOP Inc.: *See—*
Rosset, Armand J.; and Neuzil, Richard W., 4,066,677, Cl. 260-428.500.
Upjohn Company, The: *See—*
Morton, Douglas Ross, Jr., 4,066,836, Cl. 560-53.000.

Nelson, Norman A., 4,066,701, Cl. 260-590.00C.
Nelson, Norman A., 4,066,702, Cl. 260-590.00C.
Neslon, Norman A., 4,066,700, Cl. 260-590.00C.
Rizzo, Victor L., 4,066,765, Cl. 424-248.560.
Wright, John B., 4,066,769, Cl. 424-263.000.

Urano, Fumio; and Umetsu, Junji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Correcting device for cameras with automatic exposure control. 4,067,033, Cl. 354-289.000.

Urano, Fumio: *See—*
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; Mita, Kunio; Kawasaki, Masahiro; and Mori, Chiharu, 4,067,023, Cl. 354-23.00D.

Urman, Stanley: *See—*
Vidakovic, Aleksandar; Urman, Stanley; and Rudny, Donald F., 4,066,047, Cl. 123-41.120.

Urso, Charles J.: *See—*
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USM Corporation: *See—*
Holloway, David John, 4,065,952, Cl. 72-391.000.

Utamura, Yukihiko: *See—*
Takagi, Toshinori; Morimoto, Kiyoshi; and Utamura, Yukihiko, 4,066,527, Cl. 204-192.00N.

Utsugi, Mikio, to Olympus Optical Co., Ltd. Tubular medical instrument having a flexible sheath with cuffs. 4,066,070, Cl. 128-4.000.

Vaillancourt, Vincent Louis, to Johnson & Johnson. Fluid filter and method of making same. 4,066,556, Cl. 210-448.000.

Valerio, Joseph F., Jr. Rescue apparatus. 4,066,144, Cl. 182-140.000.

Valeron Corporation, The: *See—*
Beck, Hans Werner; and Jager, Herbert Paul, 4,066,380, Cl. 408-125.000.

Valmet Oy: *See—*
Aatinen, Eino, 4,065,842, Cl. 29-148.40D.

Valor Enterprises, Inc.: *See—*
Stephens, Gerald D., 4,066,324, Cl. 339-126.00J.

Van Besouw, Joannes Baptista Maria Adrianus; Gotje, Egbert Bernardus Gretinus Willem; and Kerstens, Franciscus Napoleon Adrianus, to U.S. Philips Corporation. Resonant cavity magnetron having a helical cathode. 4,066,928, Cl. 315-39.510.

van Brederode, Robert A., to Exxon Research & Engineering Co. Three component stabilizer system for propylene polymers containing grafted acrylic acid with or without glass fiber reinforcement. 4,066,608, Cl. 260-42.180.

Van Cappellen, Jan Baptist, to AGFA-Gevaert, N.V. Extrusion method and apparatus. 4,066,729, Cl. 264-169.000.

Vandas, Edward B., to McGraw-Edison Company. Kitchen ventilator damper actuator and control. 4,066,064, Cl. 126-299.00E.

Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., to Janssen Pharmaceutica N.V. 1,3-Dihydro-1-[3-(1-piperidinyl)propyl]-2H-benzimidazol-2-ones and related compounds. 4,066,772, Cl. 424-267.000.

Van der Aa, Marcel J. M. C.: *See—*
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,066,772, Cl. 424-267.000.

van der Lely, Cornelis. Prefabricated building sections or room units and methods for the manufacture of such sections or units. 4,065,905, Cl. 52-741.000.

Van Driessche, Paul. Assembling piece. 4,066,370, Cl. 403-217.000.

van Esdonk, Johannes, to U.S. Philips Corporation. Color selection lens electrodes connected by diffusion bonds. 4,066,923, Cl. 313-402.000.

Van Essen, Leonard J.: *See—*
Pfarrer, David M.; and Van Essen, Leonard J., 4,066,937, Cl. 318-221.00G.

Van Exel, Gerrit A., to Bausch & Lomb Incorporated. Optical adjustment knob with spaced apart platforms. 4,066,329, Cl. 350-77.000.

van Haaften, Peter, to American Bank Note Company. Pressurized ink applicator for intaglio printing press. 4,066,014, Cl. 101-157.000.

Van Heertum, Albert H. M. Th.: *See—*
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,066,772, Cl. 424-267.000.

Vann, Roy R. Positive tubing release coupling. 4,066,282, Cl. 285-39.000.

VanVleck, Gordon T.; and Traver, Frank J., to General Electric Company. Silicone compositions useful as green tire lubricants. 4,066,560, Cl. 252-21.000.

Van Vonno, Nicolaas W., to Harris Corporation. Substrate fed logic and method of fabrication. 4,067,038, Cl. 357-46.000.

Varadi, Maria: *See—*
Pungor, Erno; and Varadi, Maria, 4,066,406, Cl. 23-230.00R.

Vargiu, Silvio; Paparatto, Piero; Passalenti, Beppino; and Parodi, Antonio, to Societa Italiana Resine S.I.R. S.p.A. Moulding compositions including an unsaturated polyester. 4,066,606, Cl. 260-40.00R.

Varian Associates, Inc.: *See—*
Seppi, Edward J.; and Murphy, Frederick V., 4,066,901, Cl. 250-360.000.

VCA Corporation: *See—*
Patton, Phillips E.; and Freeman, Norman A., 4,065,872, Cl. 43-131.000.

Veber, Daniel F.; Nutt, Ruth F.; and Hirschmann, Ralph F., to Merck & Co., Inc. Tetrapeptide analog of TRH. 4,066,749, Cl. 424-177.000.

Venderbos, Dirk J., to Stamicarbon, N.V. Process for the preparation of urea. 4,066,693, Cl. 260-555.00A.

Veneklasen, Lee H.: *See—*
Dassler, Joachim; Veneklasen, Lee H.; and Zschimmer, Martin, 4,066,905, Cl. 250-396.00R.

Venus Scientific Inc.: *See—*
Provost, John K.; and Lien, Charles, 4,067,045, Cl. 358-211.000.

Venuto, Paul B.: *See—*
Owen, Hartley; Venuto, Paul B.; and Rosinski, Edward J., 4,066,531, Cl. 208-120.000.

Vertut, Jean: *See—*
Bourdois, Claude; Glachet, Charles; Marchal, Paul; and Vertut, Jean, 4,066,909, Cl. 250-497.000.

Vesper, Rainer; and Engelsmann, Dieter, to AGFA-Gevaert, AG. Arrangement for the delayed firing of an electronic flash unit. 4,067,029, Cl. 354-137.000.

Victor Company of Japan, Ltd.: *See—*
Ishigaki, Yukinobu; and Sasamura, Kohei, 4,066,972, Cl. 329-134.000.

Vidakovic, Aleksandar; Urman, Stanley; and Rudny, Donald F., to International Harvester Company. Toroidal heat exchanger having a hydraulic fan drive motor. 4,066,047, Cl. 123-41.120.

Vidmantas, Eugene: *See—*
Ackerman, Thomas Liddon; Barbato, Mathew Martin; and Vidmantas, Eugene, 4,065,965, Cl. 73-194.0EM.

Villazon, Francisco, to AMP Incorporated. Electrical connector. 4,066,321, Cl. 339-98.000.

Viola, James Joseph: *See—*
Godel, Siegfried; and Viola, James Joseph, 4,066,865, Cl. 219-370.000.

Virnot, Alain D.; and Cynober, Simon A., to Jeumont-Schneider. Procedure and system for driving a vehicle. 4,066,877, Cl. 364-426.000.

Viro, Felix: *See—*
Panasik, Theodore; Viro, Felix; Waxman, Burton H.; and Shannahan, Robert T., 4,066,457, Cl. 96-29.00D.

Virtanen, Jouko J.: *See—*
Melaja, Asko J.; Virtanen, Jouko J.; and Heikkila, Heikki O., 4,066,711, Cl. 260-637.00R.

Vivitar Corporation: *See—*
Parker, John C., 4,066,356, Cl. 355-63.000.

Vladuchick, Susan Anne, to Du Pont de Nemours, E. I., and Company. [1,2,5,6]Tetrathiocino-[3,4-c; 7,8-c′]diisothiazole-3,8-dicarbonitrile. 4,066,656, Cl. 260-302.00F.

Vlasak, Gary Paul: *See—*
Alpaugh, Warren Alan; Macur, George Joseph; and Vlasak, Gary Paul, 4,066,809, Cl. 427-444.000.

Vockenhuber, Karl: *See—*
Besenmatter, Walter; Muszumanski, Trude; and Wendisch, Irmgard, 4,066,340, Cl. 350-184.000.
Freudenschuss, Otto; Kantner, Otto; and Revy von Belvard, Peter, 4,066,345, Cl. 352-27.000.

Vogt, Herbert: *See—*
Grabendorfer, Werner; Vogt, Herbert; Haacke, Harri; Kuhn, Harry; Pawelletz, Reinhard; and Ries, Karl, 4,065,960, Cl. 73-627.000.

Voigt, John E.; and Pender, Herbert, Jr., to Anheuser-Busch, Incorporated. Method of making paper containing cationic starch and an anionic retention aid. 4,066,495, Cl. 162-168.0NA.

von Bredow, Brigitta; and Pissiotas, Georg, to Ciba-Geigy Corporation. Triazolidine compounds useful as herbicides. 4,066,437, Cl. 71-91.000.

von dem Hagen, Tronje. Safety guard for electrical plugs. 4,066,313, Cl. 339-75.00P.

Vonder, David L.; and Wilkis, Anthony J., to GTE Automatic Electric Laboratories Incorporated. Electrical connector assembly. 4,066,318, Cl. 339-92.00M.

von der Lehr, Alfred. Process for the joining (bonding) of lines (strips). 4,066,488, Cl. 156-83.000.

von Strandtmann, Max: *See—*
Connor, David T.; Young, Patricia A.; and von Strandtmann, Max, 4,066,655, Cl. 260-295.50T.

Voss, Klaus, to Robert Bosch G.m.b.H. Power hand tool. 4,066,133, Cl. 173-12.000.

Vowinkel, Hans: *See—*
Gross, Erwin; and Vowinkel, Hans, 4,066,063, Cl. 126-271.000.
Gross, Erwin; and Vowinkel, Hans, 4,066,122, Cl. 165-175.000.

Vukasovic, Lovro; and Raduka, Janos, to Siemens Aktiengesellschaft. Frequency converter. 4,066,954, Cl. 363-37.000.

W. C. Heraeus GmbH: *See—*
Kummer, Franz; Mai, Gerhard; Ruthardt, Rolf; and Thiede, Horst, 4,065,851, Cl. 29-630.00R.

W. R. Grace & Co.: *See—*
Murch, Robert M.; Wilson, Mary Lynn; and Wood, Louis Leonard, 4,066,578, Cl. 260-2.5AG.

W. Schlafhorst & Co.: *See—*
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Wachter, Michael P., to Ortho Pharmaceutical Corporation. Thiol- and thioncarbamates and process for preparing same. 4,066,681, Cl. 260-455.00A.

Wada, Makoto: *See—*
Kasama, Tsuneo; Wada, Makoto; Sano, Masakatu; and Tsuji, Shinzo, 4,066,415, Cl. 23-281.000.

Wada, Shinji; Matsunaga, Yoshiaki; and Noda, Michihiro, to Agency of Industrial Science & Technology. Apparatus and method for continuous froth flotation. 4,066,540, Cl. 210-44.000.

Wada, Takeshi: *See—*
Machi, Sueo; Wada, Takeshi; and Sekiya, Hiroshi, 4,066,522, Cl. 204-159.240.

Wagensonner, Eduard, to AGFA-Gevaert, AG. Motion picture camera with variable aperture control rate. 4,066,347, Cl. 352-141.000.

Wagensonner, Eduard: *See—*
Lermann, Peter; and Wagensonner, Eduard, 4,067,028, Cl. 354-141.000.

Wagner, Ralph James: *See*—
Pietruszewski, John Joseph; Scaccia, Carl; and Wagner, Ralph James, 4,066,722, Cl. 261-87.000.
Waite, Jerry M.; and Burdyn, Ralph F., to Mobil Oil Corporation. Surfactant waterflooding with hydrocarbon slug. 4,066,126, Cl. 166-273.000.
Waks, David J.; and Futterweit, Adolf, to Applied Data Research, Inc. Telephone circuit monitoring system. 4,066,843, Cl. 179-8.00A.
Waku, Makio: *See*—
Minami, Hidehiro; and Waku, Makio, 4,065,920, Cl. 60-276.000.
Waldorf, Lindsey E.; and Monroe, Kenneth E., to Waldorf, Lindsey E. Motor speed controller. 4,066,934, Cl. 318-139.000.
Waldrop, Thomas W.; and Flanagan, John R., to Sperry Rand Corporation. Toothed plate for facilitating disintegration of crop material clumps by the hammermill mechanism of a tub grinder machine. 4,066,216, Cl. 241-190.000.
Walker, David G.: *See*—
Long, Robert B.; Caruso, Fred A.; DeFeo, Richard J.; and Walker, David G., 4,066,679, Cl. 260-438.100.
Wallace, Trevor Evelyn, to Steel Engineering Company, The. Telescopic rock drill mounting. 4,066,135, Cl. 173-44.000.
Wallis, Jamie Malcolm. Sampling drill. 4,066,139, Cl. 175-232.000.
Walters, Chester H.; Barmeier, Harold J., Jr.; and Sullivan, Greig E., to National Marine Service, Incorporated. Bilge water disposal system including oil recovery means. 4,066,545, Cl. 210-71.000.
Walters, Darrel H.: *See*—
Loynes, Leslie M.; Walters, Darrel H.; and Penick, Clarence A., Jr., 4,065,946, Cl. 70-58.000.
Walters, Paul W.: *See*—
Myers, George D.; Walters, Paul W.; and Cottage, Robert L., 4,066,533, Cl. 208-153.000.
Wang, Chen-Shen, to Standard Oil Company (Indiana). Branched polyphenylene-mica composites. 4,066,604, Cl. 260-37.00R.
Wang, Hwa L.: *See*—
Kanda, Hiroshi; Wang, Hwa L.; and Hesseltine, Clifford W., 4,066,792, Cl. 426-41.000.
Wang, Robert O. Apparatus for calibrating moisture measuring instrument. 4,066,951, Cl. 324-61.00R.
Wanner, Karl; Hahner, Reinhard; Schmid, Wolfgang; Hansel, Gernot; and Bleicher, Manfred, to Robert Bosch G.m.b.H. Torque and impulse transmitting machine. 4,066,136, Cl. 173-48.000.
Ward, John Oliver: *See*—
Clark, Ian Sidney Rex; Pargeter, John Kenneth; and Ward, John Oliver, 4,066,117, Cl. 164-46.000.
Ward, William J., III: *See*—
LeBlanc, Oliver H., Jr.; and Ward, William J., III, 4,066,646, Cl. 23-259.000.
Ware, James W.: *See*—
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Warner Electric Brake & Clutch Company: *See*—
Davis, Donald L., 4,066,996, Cl. 340-52.00R.
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Connor, David T.; Young, Patricia A.; and von Strandtmann, Max, 4,066,655, Cl. 260-295.50T.
Schwender, Charles F.; and Sunday, Brooks R., 4,066,767, Cl. 424-251.000.
Watanabe, Syosaku: *See*—
Sakamoto, Masakatsu; Watanabe, Syosaku; Karino, Takafumi; Yazu, Junichi; Takashima, Kouichi; Miyashiro, Hiroshi; Takagi, Takeo; and Konno, Takao, 4,066,298, Cl. 302-2.00R.
Waters, John M., to British Railways Board. Maintenance machines for railway track. 4,065,856, Cl. 33-287.000.
Waxman, Burton H.; Mourning, Michael C.; and Panasik, Theodore, to GAF Corporation. Incorporated carboxy substituted p-phenylenediamine color developer. 4,066,456, Cl. 96-29.00D.
Waxman, Burton H.: *See*—
Panasik, Theodore; Viro, Felix; Waxman, Burton H.; and Shannahan, Robert T., 4,066,457, Cl. 96-29.00D.
Weaver, Curtis C.: *See*—
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Webb, Allen N.: *See*—
Herbstman, Sheldon; Webb, Allen N.; and Estes, John H., 4,066,716, Cl. 260-683.470.
Webb, Shirley B.: *See*—
Boyce, Clive B. C.; and Webb, Shirley B., 4,066,770, Cl. 424-263.000.
Weber, Helmut; Muth, Karl; Weyer, Rudi; Aumuller, Walter; and Haack, Erich, to Hoechst Aktiengesellschaft. Benzene-sulfonyl semicarbazides and process for preparing them. 4,066,639, Cl. 260-239.0BF.
Weber, Howard Fredrick: *See*—
Shaw, Mark Layne; and Weber, Howard Fredrick, 4,066,876, Cl. 235-92.0CM.
Weber, Jurgen: *See*—
Hahn, Heinz-Dieter; and Weber, Jurgen, 4,066,835, Cl. 560-98.000.
Webster, James A. Cycle pump security system. 4,065,944, Cl. 70-58.000.
Wedel, Mark J., to Atlas Manufacturing, Inc. Cash drawer. 4,066,308, Cl. 312-333.000.
Wedgeworth, Wiley W.: *See*—
Gullotti, Damian V.; Fayard, William S.; and Wedgeworth, Wiley W., 4,066,476, Cl. 148-11.50A.
Gullotti, Damian V.; Fayard, William S.; and Wedgeworth, Wiley W., 4,066,480, Cl. 148-11.50A.
Weinberg, Norman. Light extractor-diffuser. 4,066,885, Cl. 362-18.000.
Wellington Puritan Mills, Inc.: *See*—
Sharp, Austin S., 4,066,219, Cl. 242-46.200.
Wells, John A.: *See*—
Carlin, Joseph T.; Ware, James W.; Mills, Melvin E., Jr.; and Wells, John A., 4,066,124, Cl. 166-252.000.
Wendisch, Irmgard: *See*—
Besenmatter, Walter; Muszumanski, Trude; and Wendisch, Irmgard, 4,066,340, Cl. 350-184.000.
Wenger, Gerald W. Transmission gear shift control. 4,065,982, Cl. 74-473.00R.
Wenschhof, Donald Edward, Jr.: *See*—
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Western Electric Company, Inc.: *See*—
Bierenfeld, Herbert H.; McGonigal, Charles; Horton, Chauncey M., Jr.; and Kelsey, John A., 4,066,317, Cl. 339-91.00R.
D'Altroy, Frederick A.; Harrington, Daniel J.; and Miller, Gerald W., 4,066,483, Cl. 148-187.000.
Goodrich, Allen R.; Horton, Chauncey M., Jr.; Thaeler, Leigh M.; and Toivola, John O., 4,066,320, Cl. 339-98.000.
Western Geophysical Company of America: *See*—
Savit, Carl H., 4,066,993, Cl. 340-15.5TS.
Westinghouse Air Brake Company: *See*—
Elder, J. Calvin, 4,066,228, Cl. 246-5.000.
Westinghouse Brake & Signal Co. Ltd.: *See*—
King, Kenneth Gordon; and Burch, Derek Ernest, 4,066,916, Cl. 307-253.000.
Westinghouse Electric Corporation: *See*—
Chow, Kung C., 4,067,053, Cl. 361-76.000.
DiFerdinando, Frank L., 4,066,384, Cl. 416-189.000.
Newton, Ralph E., 4,066,926, Cl. 315-73.000.
Westlund, Lars-Erik: *See*—
Jonsson, Nils Ake; Merenyi, Ferenc; and Westlund, Lars-Erik, 4,066,408, Cl. 23-230.00R.
Westvaco Corporation: *See*—
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Wetherell, Daniel L., to General Electric Company. Coupling arrangement for power line carrier systems. 4,066,912, Cl. 307-3.000.
Weyer, Rudi: *See*—
Weber, Helmut; Muth, Karl; Weyer, Rudi; Aumuller, Walter; and Haack, Erich, 4,066,639, Cl. 260-239.0BF.
Weyker, Robert George; and Baitinger, William Frederick, Jr., to American Cyanamid Company. Flame retardant finish for textiles. 4,066,391, Cl. 8-116.00P.
Wharton, David G., to Shell Oil Company. Gasoline compositions. 4,066,419, Cl. 44-72.000.
Whateley, Eric Albert; and Pengilly, Eric Alexander, to David Brown Gear Industries Limited. Gearing. 4,065,981, Cl. 74-410.000.
Wheatley, Charles E., III: *See*—
Costanza, Samuel T.; Franklin, Peter G.; Gebhardt, Frank L.; Israel, Jack D.; Moore, Charles R.; and Wheatley, Charles E., III, 4,066,964, Cl. 325-55.000.
Wheeler, Delwyn Roche, Jr., to International Business Machines Corporation. Test vehicle for selectively inserting diagnostic signals into a bus-connected data-processing system. 4,066,883, Cl. 235-304.000.
Wheeler, Harold A.; and Lopez, Alfred R., to Hazeltine Corporation. Correlation receiver for doppler microwave landing system. 4,067,014, Cl. 343-113.0DE.
White Farm Equipment Company: *See*—
Zandbergen, Herman P., 4,066,131, Cl. 172-680.000.
White, James N.; and Seeger, Richard E., to Chomerics, Inc. Keyboard switch assembly having foldable printed circuit board, integral spacer and preformed depression-type alignment fold. 4,066,851, Cl. 200-5.00A.
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Wiegert, Gerald A.; and Negele, James R., to Wiegert, Gerald A.; and Dyer, Richard S. Bicycle fairing. 4,066,290, Cl. 296-78.100.
Wilbourn, James P., to Texaco Inc. Single point mooring with strain relief anchoring. 4,065,822, Cl. 9-8.00P.
Wilkis, Anthony J.: *See*—
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Williamson, Larry H. Rebreathable gas mixing and control device. 4,066,076, Cl. 128-142.200.

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Winters, Donald C.; Haemer, Laurence F.; and Powell, William H., to Congoleum Corporation. Methods of reducing the growth of cellulose-backed flooring products and the resulting cellulose-backed flooring products. 4,066,813, Cl. 426-282.000.
Wirbser, Oskar; and Ernst, Nikolaus, to Siemens Aktiengesellschaft. Process and device for unsoldering semiconductor modules in the flip-chip technique. 4,066,204, Cl. 228-264.000.
Wismer, Marco; and Bosso, Joseph F., to PPG Industries, Inc. Zwitter-ion-containing compositions. 4,066,592, Cl. 260-29.2EP.
Witkin, Donald E.; and Bowles, Arnold G., to National Forge Company. Temperature control method and apparatus. 4,066,868, Cl. 219-486.000.
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Woessner, Warren Dexter; Biddlecom, William Gerard; Arndt, Henry Clifford; Peruzzotti, George Peter; and Sih, Charles John, to Miles Laboratories, Inc. Cycloalkenyl analogues of prostaglandins E. 4,066,834, Cl. 560-121.000.
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Wollensak, John C.; Ihrman, Kryn G.; and Elsey, Paul G., to Ethyl Corporation. Antioxidant. 4,066,562, Cl. 252-52.00R.
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Young, Daniel Arthur. Method of lining a waterway or reservoir. 4,065,924, Cl. 61-7.000.

Young, Jonathan D.; and Caldecott, Ross, to Ohio State University, The. Pulse shaper for coaxial cable system. 4,066,970, Cl. 328-67.000.

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Young, Robert A. Thin film excitation. 4,066,980, Cl. 331-94.50G.

Young, Robert Eric, to Serck Industries Limited. Data transmitting systems. 4,066,841, Cl. 178-66.00R.

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Zandbergen, Herman P., to White Farm Equipment Company. Hitch assembly for garden tractor and independently operable ground tiller. 4,066,131, Cl. 172-680.000.

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Zeller, Hans Rudolf, to BBC Brown Boveri & Company Limited. Electrode for a controllable electrochromic indicator device and method of manufacture. 4,066,336, Cl. 350-160.00R.

Zenith Radio Corporation: *See*—
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Zenk, George Edward, to Control Data Corporation. Membrane-type touch panel employing a photo-resist insulating grid anti-short means. 4,066,852, Cl. 200-5.00A.

Zenk, George Edward, to Control Data Corporation. Membrane type touch panel employing piezoresistant anti-short means. 4,066,853, Cl. 200-5.00A.

Zenk, George Edward; and Ditzik, Richard Joseph, to Control Data Corporation. Membrane-type touch panel employing insulating grid anti-short means. 4,066,854, Cl. 200-5.00A.

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LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 3RD DAY OF JANUARY, 1978

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Bach, Christopher W.: *See*—
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Bell Telephone Laboratories Incorporated: *See*—
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Boyette, Gerald B.: *See*—
Sweetana, Andrew S., Jr.; Boyette, Gerald B.; and Brown, Frederick J., T966,010, Cl. 323-61.000.

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Sweetana, Andrew S., Jr.; Boyette, Gerald B.; and Brown, Frederick J., T966,010, Cl. 323-61.000.

Carelli, Mario D.; and Bach, Christopher W., to United States of America, Energy Research and Development Administration. Method of cooling a fast-breeder reactor. T966,004, 1-3-78, Cl. 176-40.000.

Caterpillar Tractor Co.: *See*—
Liehr, Douglas P.; and Sutton, Robert A., T966,007, Cl. 296-28.00R.

Du Pont de Nemours, E. I., and Company: *See*—
Forsythe, George Daniel, T966,001, Cl. 28-100.000.

Forsythe, George Daniel, to Du Pont de Nemours, E. I., and Company. Apparatus and method for multiple strand web formation. T966,001, 1-3-78, Cl. 28-100.000.

Freeman, John Leslie; and Rose, John Brewster, to Imperial Chemical Industries Limited. Aromatic polymers. T966,006, 1-3-78, Cl. 260-49.000.

Gardineer, Bayard G., Jr.; Manning, Stanley A.; Meeks, Arthur E.; and Musits, Bela, to International Business Machines Corporation. Static free fluid bearing track system. T966,009, 1-3-78, Cl. 302-2.00R.

Gillette, Dean, to Bell Telephone Laboratories Incorporated. Repertory dialer. T966,005, 1-3-78, Cl. 179-90.00B.

Howard, Philip H., to International Business Machines Corporation. Pattern-recognition system and method. T966,011, 1-3-78, Cl. 340-146.3AC.

Imperial Chemical Industries Limited: *See*—
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Freeman, John Leslie; and Rose, John Brewster, T966,006, Cl. 260-49.000.
Newton, Alan Branford; and Priddle, John Edward, T966,013, Cl. 526-140.000.

International Business Machines Corporation: *See*—
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Liehr, Douglas P.; and Sutton, Robert A., to Caterpillar Tractor Co. Main frame for a loader vehicle. T966,007, 1-3-78, Cl. 296-28.00R.

Manning, Stanley A.: *See*—
Gardineer, Bayard G., Jr.; Manning, Stanley A.; Meeks, Arthur E.; and Musits, Bela, T966,009, Cl. 302-2.00R.

Maskasky, Joe E. Photographic elements containing vapor deposited silver halide layers. T966,003, 1-3-78, Cl. 96-94.0BF.

Meeks, Arthur E.: *See*—
Gardineer, Bayard G., Jr.; Manning, Stanley A.; Meeks, Arthur E.; and Musits, Bela, T966,009, Cl. 302-2.00R.

Murray, Charles Robertson: *See*—
Barnes, John Grover; and Murray, Charles Robertson, T966,002, Cl. 93-8.0VB.

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Newton, Alan Branford; and Priddle, John Edward, to Imperial Chemical Industries Limited. Transition metal compound. T966,013, 1-3-78, Cl. 526-140.000.

Priddle, John Edward: *See*—
Newton, Alan Branford; and Priddle, John Edward, T966,013, Cl. 526-140.000.

Reicher, Alexis. Woven elastic fabric and process for making. T966,012, 1-3-78, Cl. 428-259.000.

Rose, John Brewster: *See*—
Freeman, John Leslie; and Rose, John Brewster, T966,006, Cl. 260-49.000.

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Sweetana, Andrew S., Jr.; Boyette, Gerald B.; and Brown, Frederick J., to Westinghouse Electric Corporation. Capacitive voltage transformer with improved compensating reactor arrangement. T966,010, 1-3-78, Cl. 323-61.000.

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Sweetana, Andrew S., Jr.; Boyette, Gerald B.; and Brown, Frederick J., T966,010, Cl. 323-61.000.

Williams, James E. Oxidation of p-xylene to terephthalaldehyde. T966,008, 1-3-78, Cl. 260-599.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF JANUARY, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bendix Corporation, The: *See*—
Pauwels, Edward M.; Jordan, David D.; and Suttle, Ward C., Re. 29,509, Cl. 310-168.000.

Cabot Corporation: *See*—
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Eli Lilly and Company: *See*—
O'Doherty, George O. P., Re. 29,508, Cl. 260-562.00B.

Hull, George Robert, to Tektronix, Inc. High efficiency switching drive for a resonate power transformer. Re. 29,510, Cl. 363-21.000.

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Long-Lok Fasteners Corporation: *See*—
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O'Doherty, George O. P., to Eli Lilly and Company. Ring-substituted N-(2,2-difluoroalkanoyl)-o-phenylenediamine compounds. Re. 29,508, Cl. 260-562.00B.

Pauwels, Edward M.; Jordan, David D.; and Suttle, Ward C., to Bendix Corporation, The. Wheel speed sensor for an adaptive braking system. Re. 29,509, Cl. 310-168.000.

Schwenzfeier, Otto Kurt, to Long-Lok Fasteners Corporation. Apparatus for forming self locking fasteners. Re. 29,507, Cl. 156-498.000.

Siebert, Sidney A.: *See*—
Young, Richard W.; and Siebert, Sidney A., Re. 29,506, Cl. 29-527.400.

Suttle, Ward C.: *See*—
Pauwels, Edward M.; Jordan, David D.; and Suttle, Ward C., Re. 29,509, Cl. 310-168.000.

Tektronix, Inc.: *See*—
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Young, Richard W.; and Siebert, Sidney A., to Cabot Corporation. Method of sealing the end of a filled welding rod. Re. 29,506, Cl. 29-527.400.

LIST OF PLANT PATENTEES

McRae, Edward A., to Melridge, Inc. Lily plant: Lilium 'Headlight'. 4,174, 1-3-78, Cl. 68.000.
McRae, Edward A., to Melridge, Inc. Lily plant: Lilium 'Firecracker'. 4,175, 1-3-78, Cl. 68.000.
McRae, Edward A., to Melridge, Inc. Lily plant: Lilium 'Firebrand'. 4,176, 1-3-78, Cl. 68.000.
McRae, Edward A., to Melridge, Inc. Lily plant: Lilium 'Showboat'. 4,177, 1-3-78, Cl. 68.000.
McRae, Edward A., to Melridge, Inc. Lily plant: Lilium 'Lovesong'. 4,178, 1-3-78, Cl. 68.000.
McRae, Edward A., to Melridge, Inc. Lilly plant: Lilium 'Twilight'. 4,179, 1-3-78, Cl. 68.000.
McRae, Edward A., to Melridge, Inc. Lily plant: Lilium 'charisma'. 4,180, 1-3-78, Cl. 68.000.
McRae, Edward A., to Melridge, Inc. Lily plant Lilium 'Dayspring'. 4,181, 1-3-78, Cl. 68.000.
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McRae, Edward A., 4,174, Cl. 68.000.
McRae, Edward A., 4,175, Cl. 68.000.
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Acricite Company, Inc.: *See*—
Schwartz, Lawrence B., 246,874, Cl. D87-3.00F.
Allen, Johnny G. Mobile garbage can holder. 246,848, 1-3-78, Cl. D12-21.000.
Baker, Stanley Z., to J. T. Eaton & Company. Rodent bait feeding box or similar article. 246,854, 1-3-78, Cl. D22-18.000.
Ball Corporation: *See*—
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Campbell, William B., 246,832, Cl. D11-125.000.
Campbell, William B., 246,833, Cl. D11-125.000.
Campbell, William B., 246,834, Cl. D11-127.000.
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Campbell, William B., 246,836, Cl. D11-128.000.
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Campbell, William B., 246,840, Cl. D11-134.000.
Campbell, William B., 246,841, Cl. D11-136.000.
Campbell, William B., 246,842, Cl. D11-137.000.
Berchem, Donald J., to Chrysler Corporation. Exhaust outlet housing for outboard motors. 246,853, 1-3-78, Cl. D15-4.000.
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Campbell, William B., to Ball Corporation. Christmas ornament. 246,831, 1-3-78, Cl. D11-125.000.
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Campbell, William B., to Ball Corporation. Christmas ornament. 246,833, 1-3-78, Cl. D11-125.000.
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Campbell, William B., to Ball Corporation. Plaque. 246,840, 1-3-78, Cl. D11-134.000.
Campbell, William B., to Ball Corporation. Plaque. 246,841, 1-3-78, Cl. D11-136.000.
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Deitch, James C., to Magnetic Controls Company. Telephone jack housing and cover. 246,852, 1-3-78, Cl. D14-59.000.
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Facey, Raymond L. Plant trellis. 246,860, 1-3-78, Cl. D25-71.000.
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Hennecke, Charles F., to Stewart-Warner Corporation. Rim drive for a bicycle speedometer. 246,850, 1-3-78, Cl. D12-114.000.
Horowitz, Leonard: *See*—
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Itakura, Hitoshi, to Tomy Kogyo Co., Inc. Racing game box. 246,868, 1-3-78, Cl. D34-5.0CC.
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Klein, Brigitte I.: *See*—
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Kling, Laura J. Handbag. 246,873, 1-3-78, Cl. D87-3.00C.
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Krysakowski, John F. Golf putter head. 246,865, 1-3-78, Cl. D34-5.0GH.
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Larson, Scott E. Insulated holder for a nursing bottle. 246,858, 1-3-78, Cl. D24-48.000.
Ledford, Adele K. Box harp. 246,869, 1-3-78, Cl. D56-1.00A.

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Loomis, James F., to Industrial & Promotional Toys, Inc. Toy airplane. 246,866, 1-3-78, Cl. D34-15.0HH.
Loomis, James F., to Industrial & Promotional Toys, Inc. Toy airplane. 246,867, 1-3-78, Cl. D34-15.0HH.
Lossini, Elio, to Raybeth Tool & Die Co., Inc. Bracelet. 246,830, 1-3-78, Cl. D11-12.000.
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Magnetic Controls Company: *See—*
Deitch, James C., 246,852, Cl. D14-59.000.
Mainetti, Mario, to Mainetti S.p.A. Skirt hanger. 246,817, 1-3-78, Cl. D6-252.000.
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McEvers, Wilbur C. Rain gauge box. 246,829, 1-3-78, Cl. D10-101.000.
Mettler Instruments AG: *See—*
Meuli, Martin; and Tresch, Josef, 246,857, Cl. D24-8.000.
Meuli, Martin; and Tresch, Josef, to Mettler Instruments AG. Apparatus for determining the melting point of materials. 246,857, 1-3-78, Cl. D24-8.000.
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Suganoya, Yoshio; and Miyake, Takao, 246,821, Cl. D7-128.000.
O'Connor, John F., to Torin Corporation. Air impeller. 246,856, 1-3-78, Cl. D23-165.000.
Peggs, Albert L. Combined divider and sign holder for merchandise bins. 246,814, 1-3-78, Cl. D6-85.000.
Raybeth Tool & Die Co., Inc.: *See—*
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Rubbermaid Industrial Products Corporation: *See—*
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White, Thomas H., 246,872, Cl. D87-1.00R.
Schmitz, Earl E. Scaffold jack. 246,859, 1-3-78, Cl. D25-68.000.
Schwartz, Lawrence B., to Acricite Company, Inc. Handbag. 246,874, 1-3-78, Cl. D87-3.00F.
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Suganoya, Yoshio; and Miyake, Takao, 246,821, Cl. D7-128.000.
Sheesley, Donald L.; and Blanshine, Allison W., to Sperry Rand Corporation. Bale handling apparatus. 246,845, 1-3-78, Cl. D15-32.000.
Sillers, Phyllis S. Pillow. 246,815, 1-3-78, Cl. D6-202.000.
Silver, Robert L.; and Eisenhut, Bert R., to Triple E Corporation. Material handling box. 246,871, 1-3-78, Cl. D87-1.00R.
Sperry Rand Corporation: *See—*
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Stewart-Warner Corporation: *See—*
Hennecke, Charles F., 246,850, Cl. D12-114.000.
Stoufer, William. Combined trash container and trash bag holder. 246,822, 1-3-78, Cl. D7-194.000.
Stutzer, Franz Alban, to Rowenta-Werke, GmbH. Lighter. 246,863, 1-3-78, Cl. D27-42.000.
Suganoya, Yoshio; and Miyake, Takao, to Sharp Kabushiki Kaisha. Electronic cooking range. 246,820, 1-3-78, Cl. D7-128.000.
Suganoya, Yoshio; and Miyake, Takao, to Sharp Kabushiki Kaisha. Cooking range. 246,821, 1-3-78, Cl. D7-128.000.
Tam, John; and Horowitz, Leonard. Contour mat. 246,816, 1-3-78, Cl. D6-201.000.
Tarchalski, Edward; and Lisnay, Albert D., to Heinemann Electric Company. Multi-pole circuit breaker. 246,851, 1-3-78, Cl. D13-34.000.
Tolleson, Thomas H., to Krueger Metal Products, Inc. Chair. 246,813, 1-3-78, Cl. D6-75.000.
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Itakura, Hitoshi, 246,868, Cl. D34-5.0CC.
Torin Corporation: *See—*
O'Connor, John F., 246,856, Cl. D23-165.000.
Treloar, Howard Archibald. Coupling. 246,855, 1-3-78, Cl. D23-43.000.
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Triple E Corporation: *See—*
Silver, Robert L.; and Eisenhut, Bert R., 246,871, Cl. D87-1.00R.
Wenrick, Brian A., to Helene Curtis Industries, Inc. Combined trim strip and removable paper backing therefor. 246,861, 1-3-78, Cl. D25-79.000.
White, Thomas H., to Rubbermaid Industrial Products Corporation. Tote box lid. 246,828, 1-3-78, Cl. D9-267.000.
White, Thomas H., to Rubbermaid Industrial Products Corporation. Tote box. 246,872, 1-3-78, Cl. D87-1.00R.

CLASSIFICATION OF PATENTS

ISSUED JANUARY 3, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

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CLASS 128

1.5	4,066,065
2 F	4,066,067
2 R	4,066,068
2.05 P	4,066,066
2.06 E	4,066,078
2.06 F	4,066,069
4	4,066,070
7	4,066,071
40	4,066,072
79	4,066,073
89 R	4,066,074
127	4,066,075
142.2	4,066,076
145 A	4,066,077
218 N	4,066,079
251	4,066,080
287	4,066,081
303 R	4,066,082
325	4,066,083
327	4,066,084
418	4,066,085
421	4,066,086

CLASS 130

30 H	4,066,087

CLASS 131

185	4,066,088

CLASS 134

34	4,066,472

CLASS 135

3 E	4,066,089

CLASS 137

62	4,066,090
79	4,066,091
93	4,066,092
355.2	4,066,093
387	4,066,094
486	4,066,095
504	4,066,096
563	4,066,097
615	4,066,098
625.3	4,066,100
625.6	4,066,101
625.64	4,066,102
	4,066,103
625.66	4,066,099

CLASS 139

11	4,066,104
54	4,066,105
420 C	4,066,106

CLASS 141

11	4,066,107
68	4,066,108

CLASS 144

28.11	4,066,109
193 A	4,066,110

CLASS 145

4	4,066,111

CLASS 148

1.5	4,066,473
2	4,066,474
3	4,066,475
11.5 A	4,066,476
	4,066,480
15	4,066,477
26	4,066,478
111	4,066,479
174	4,066,481

175 4,066,482
187 4,066,483
4,066,484
188 4,066,485

CLASS 152

213 A 4,066,112
430 4,066,113

CLASS 156

48 4,066,486
72 4,066,487
83 4,066,488
258 4,066,489
276 4,066,490
498 Re.29,507
644 4,066,491

CLASS 162

49 4,066,492
158 4,066,493
164 EP 4,066,494
168 NA 4,066,495

CLASS 164

4 4,066,114
9 4,066,115
17 4,066,116
46 4,066,117

CLASS 165

18 4,066,118
41 4,066,119
165 4,066,120
170 4,066,121
175 4,066,122

CLASS 166

68.5 4,066,123
202 4,066,125
252 4,066,124
273 4,066,126
278 4,066,127
315 4,066,128

CLASS 169

37 4,066,129

CLASS 172

81 4,066,130
572 4,066,132
680 4,066,131

CLASS 173

12 4,066,133
27 4,066,134
44 4,066,135
48 4,066,136

CLASS 174

35 GC 4,066,837
48 4,066,838
52 PE 4,066,839
72 R 4,066,840

CLASS 175

14 4,066,137
16 4,066,138
232 4,066,139

CLASS 176

3 4,066,496
22 4,066,497
38 4,066,498
4,066,499
78 4,066,500

CLASS 177

134 4,066,140

CLASS 178

66 R 4,066,841

CLASS 179

1 P 4,066,842
8 A 4,066,843
15 BT 4,066,845
15 BW 4,066,844
16 EC 4,066,846
84 R 4,066,848
99 4,066,847
178 4,066,849

CLASS 180

2 R 4,066,141
33 A 4,066,142
77 S 4,066,143

CLASS 182

140 4,066,144
153 4,066,145

CLASS 184

1 R 4,066,146
15 R 4,066,147

CLASS 187

17 4,066,148

CLASS 188

1 A 4,066,150
1 C 4,066,149
5 4,066,151
171 4,066,152
196 BA 4,066,154
196 M 4,066,153

CLASS 190

3 4,066,155
18 A 4,066,156

CLASS 192

3.24 4,066,157

CLASS 193

34 4,066,158

CLASS 195

29 4,066,501
47 4,066,502
62 4,066,503
63 4,066,504
66 B 4,066,506
66 R 4,066,505
80 R 4,066,507
99 4,066,508
103.5 M 4,066,511
103.5 R 4,066,509
4,066,510
127 4,066,512

CLASS 196

132 4,066,159

CLASS 197

18 4,066,160

CLASS 198

334 4,066,161
377 4,066,162
442 4,066,163
616 4,066,164

CLASS 200

5 A 4,066,850
4,066,851
4,066,852
4,066,853
4,066,854
4,066,855
11 R 4,065,812
44 4,066,856
61.7 4,066,857
84 C 4,066,858
263 4,066,859
308 4,066,860

CLASS 201

39 4,066,513

CLASS 203

11 4,066,514

CLASS 204

14 N 4,066,515
15 4,066,516
43 N 4,066,517
86 4,066,518
98 4,066,519
108 4,066,520
141.5 4,066,521
159.15 4,066,523
159.23 4,066,524
159.24 4,066,522
181 4,066,525
186 4,066,526
192 N 4,066,527
195 T 4,066,528

CLASS 206

340 4,066,165
427 4,066,166
627 4,066,167

CLASS 208

11 R 4,066,529
112 4,066,530
120 4,066,531
131 4,066,532
153 4,066,533

CLASS 209

82 4,066,534
139 A 4,066,535
155 4,066,536
223 R 4,066,537

CLASS 210

15 4,066,538
36 4,066,539
44 4,066,540
51 4,066,541
4,066,542
63 R 4,066,543
64 4,066,544
71 4,066,545
75 4,066,546
78 4,066,547
160 4,066,548
177 4,066,549
183 4,066,550
282 4,066,551
304 4,066,552
321 R 4,066,553
342 4,066,554
402 4,066,555
448 4,066,556
470 4,066,557

CLASS 211

4 4,066,168
57.1 4,066,169
63 4,066,170
69.1 4,066,171
78 4,066,172

CLASS 214

1 C 4,066,173
7 4,066,174
35 R 4,066,175
43 4,066,176
152 4,066,177
313 4,066,178
356 4,066,179

CLASS 215

247 4,066,183
254 4,066,180
256 4,066,181
4,066,182

CLASS 219

61 4,066,861
76.14 4,066,862
121 EM 4,066,863
4,066,864
370 4,066,865
388 4,066,866
483 4,066,867
486 4,066,868
490 4,066,869
528 4,066,870

CLASS 220

9 LG 4,066,184

CLASS 221

26 4,066,185

CLASS 222

48 4,066,186
57 4,066,187
146 HE 4,066,188
334 4,066,189
529 4,066,190
569 4,066,191

CLASS 223

72 4,066,192
88 4,066,193
111 4,066,194

CLASS 224

8 R 4,066,195
30 A 4,066,196
42.01 4,066,197

CLASS 227

8 4,066,198
10 4,066,199

CLASS 228

3.1 4,066,200
115 4,066,201
173 E 4,066,202
180 R 4,066,203
264 4,066,204

CLASS 229

17 B 4,066,205
17 SC 4,066,207
69 4,066,206

CLASS 232

1 C 4,066,208
35 4,066,209

CLASS 235

54 F 4,066,871
92 CM 4,066,874
4,066,876
92 TF 4,066,875
302 4,066,882
302.3 4,066,880
304 4,066,883
487 4,066,873

CLASS 237

53 4,066,210

CLASS 238

10 F 4,066,211
349 4,066,212

CLASS 239

265.19 4,066,214
533.3 4,066,213

CLASS 241

46.11 4,066,215
190 4,066,216

CLASS 242

25 R 4,066,217
35.5 A 4,066,218
46.2 4,066,219
55 4,066,220
55.19 A 4,066,221
107.4 A 4,066,223
107.4 B 4,066,222
115 4,066,224
118.8 4,066,225

CLASS 244

36 4,066,226
118 P 4,066,227

CLASS 246

5 4,066,228
34 CT 4,066,229
182 B 4,066,230

CLASS 248

13 4,066,231
226.2 4,066,232
231 4,066,233
358 R 4,066,234
482 4,066,235

CLASS 249

160 4,066,236
213 4,066,237

CLASS 250

199 4,066,890
253 4,066,891
270 4,066,892
282 4,066,893
292 4,066,894
296 4,066,895
315 A 4,066,896
358 P 4,066,899
358 R 4,066,897
359 4,066,898
360 4,066,900
4,066,901
363 S 4,066,902
4,066,903
372 4,066,904
396 R 4,066,905
445 T 4,066,906
453 4,066,907
483 4,066,908
497 4,066,909
555 4,066,910

CLASS 251

6 4,066,238
31 4,066,239
175 4,066,240
361 4,066,241

CLASS 252

8.9 4,066,558
10 4,066,559
21 4,066,560
33.4 4,066,561
52 R 4,066,562
62.1 P 4,066,563
62.56 4,066,564
4,066,565
136 4,066,566
299 4,066,567
4,066,569
4,066,570
316 4,066,568
431 C 4,066,571
437 4,066,572
439 4,066,573
4,066,574
475 4,066,575
511 4,066,576

CLASS 254

10.5 4,066,242
133 R 4,066,243

CLASS 256

1 4,066,244

CLASS 260

2 R 4,066,577
2.5 AG 4,066,578
2.5 AP 4,066,579
2.5 AW 4,066,580
8 4,066,581
17 A 4,066,582
17.4 CL 4,066,584
17.4 SG 4,066,583
18 N 4,066,585
22 CB 4,066,586
22 D 4,066,587
22 TN 4,066,588
28.5 A 4,066,590
29.2 E 4,066,593
29.2 EP 4,066,592
29.2 M 4,066,594
29.2 TN 4,066,591
29.4 R 4,066,595
29.6 H 4,066,589
29.6 R 4,066,596
29.6 WB 4,066,597
29.7 S 4,066,598
30.6 R 4,066,599
4,066,600
30.8 R 4,066,601
4,066,602
37 EP 4,066,605
37 R 4,066,604
37 SB 4,066,603
40 R 4,066,606
4,066,607
42.18 4,066,608
4,066,609
42.21 4,066,610
42.53 4,066,612
42.54 4,066,613
45.8 A 4,066,611
4,066,617
45.8 NT 4,066,615
4,066,616
45.8 NZ 4,066,614
45.85 T 4,066,618
45.95 C 4,066,619
47 C 4,066,620
4,066,623
47 CP 4,066,622
47 UA 4,066,621
49 4,066,624
59 R 4,066,625
75 M 4,066,627
75 N 4,066,626
77.5 D 4,066,630
77.5 R 4,066,628
4,066,629
78 R 4,066,631
79.1 4,066,632
112 R 4,066,633
112.5 R 4,066,635
4,066,684
112.5 S 4,066,634
117 4,066,636
146 R 4,066,637
196 4,066,638
239 BF 4,066,639
239.1 4,066,640
251 P 4,066,642
256.4 F 4,066,643
4,066,644
4,066,645
268 SY 4,066,649
268 TR 4,066,647
4,066,648
281 G 4,066,650
287 K 4,066,651
289 XA 4,066,652
293.61 4,066,653
293.69 4,066,654
295.5 T 4,066,655
302 F 4,066,656
306.7 R 4,066,657
326.13 F 4,066,659
326.14 R 4,066,660
326.15 4,066,661
326.2 4,066,658
326.85 4,066,662
327 B 4,066,663
332.2 H 4,066,664
332.5 4,066,665
340.9 AS 4,066,666
345.3 4,066,667
347.3 4,066,668
347.5 4,066,669
347.7 4,066,670
4,066,671
4,066,672
348.13 4,066,673
397.5 4,066,674
400 4,066,675
402.5 4,066,676
428.5 4,066,677
429 R 4,066,678
438.1 4,066,679
448.2 E 4,066,680
455 A 4,066,681
462 R 4,066,682
465.5 R 4,066,683
500.5 H 4,066,686
531 R 4,066,691
535 P 4,066,687
4,066,688
544 C 4,066,689
544 Y 4,066,690
555 A 4,066,693
559 AT 4,066,694
562 B Re.29,508
564 E 4,066,695
564 R 4,066,696
567 4,066,697
569 4,066,698
583 R 4,066,699
590 C 4,066,700
4,066,701
4,066,702
592 4,066,703
604 HF 4,066,705
604 R 4,066,704
610 B 4,066,706
613 D 4,066,708
613 R 4,066,707
618 B 4,066,709
631.5 4,066,710
637 R 4,066,711
668 D 4,066,712
677 A 4,066,713
682 4,066,714
683.15 B 4,066,715
683.47 4,066,716
874 4,066,717
878 B 4,066,718
970 4,066,719

CLASS 261

44 R 4,066,720
62 4,066,721
87 4,066,722

CLASS 264

34 4,066,723
39 4,066,724
40.5 4,066,725
89 4,066,726
94 4,066,727
162 4,066,728
169 4,066,729
191 4,066,730
216 4,066,731
229 4,066,732

CLASS 266

216 4,066,248

CLASS 269

21 4,066,249
43 4,066,250

CLASS 270

37 4,066,251

CLASS 271

3 4,066,252
4 4,066,253
236 4,066,254
265 4,066,255

CLASS 272

18 4,066,256
69 4,066,257
85 4,066,258
94 4,066,259

CLASS 273

73 C 4,066,260
102 B 4,066,261
105 R 4,066,262
143 R 4,066,264
153 R 4,066,265
273 4,066,263

CLASS 274

23 R 4,066,266
4,066,267
42 R 4,066,268

CLASS 277

228 4,066,269

CLASS 279

2 R 4,066,270

CLASS 280

1.182 4,066,271
79.1 R 4,066,272
211 4,066,273
411 A 4,066,274
605 4,066,275
4,066,276
626 4,066,277
710 4,066,278
711 4,066,279

CLASS 283

8 R 4,066,280

CLASS 285

31 4,066,281
39 4,066,282
53 4,066,283

CLASS 290

44 4,066,911

CLASS 292

62 4,066,284

CLASS 293

4,066,285
87 4,066,286

CLASS 294

74 4,066,287
83 R 4,066,288

CLASS 296

1 A 4,066,289
78.1 4,066,290
4,066,291
137 C 4,066,292

CLASS 297

325 4,066,293
4,066,294
443 4,066,295

CLASS 298

22 J 4,066,296

CLASS 299

4 4,066,297

CLASS 302

2 R 4,066,298

CLASS 303

6 C 4,066,303
20 4,066,299
96 4,066,300
115 4,066,301

CLASS 305

11 4,066,302

CLASS 307

3 4,066,912
38 4,066,913
237 4,066,914
238 4,066,915
253 4,066,916
304 4,066,917
4,066,918
353 4,066,919

CLASS 308

3.5 4,065,852
201 4,066,304

CLASS 310

61 4,066,921
80 4,066,922
168 Re.29,509
310 4,066,920

CLASS 312

195 4,066,305
224 4,066,306
242 4,066,307
333 4,066,308

CLASS 313

402 4,066,923
408 4,066,924
503 4,066,925

CLASS 315

3.5 4,066,927
39.51 4,066,928
73 4,066,926
169 TV 4,066,929
209 R 4,066,930
241 R 4,066,931
244 4,066,932

CLASS 316

5 4,066,309
19 4,066,310
28 4,066,311

CLASS 318

60 4,066,933
138 4,066,935
139 4,066,934
4,066,936
221 G 4,066,937
227 4,066,938
251 4,066,939
294 4,066,940
341 4,066,941
434 4,066,942
468 4,066,943
571 4,066,944
681 4,066,945
685 4,066,946
696 4,066,947

CLASS 322

16 4,066,957

CLASS 324

30 R 4,066,948
51 4,066,950
61 R 4,066,951
83 D 4,066,952
123 R 4,066,953
125 4,066,958
141 4,066,959
142 4,066,960
163 4,066,961
208 4,066,962
262 4,066,949

CLASS 325

55 4,066,964
120 4,066,965
308 4,066,966
310 4,066,967

CLASS 328

1 4,066,968
5 4,066,969
67 4,066,970
267 4,066,971

CLASS 329

134 4,066,972

CLASS 330

10 4,066,973
4,066,974
81 4,066,975
86 4,066,976
129 4,066,977

CLASS 331

1 A 4,066,978
56 4,066,979
94.5 G 4,066,980
108 B 4,066,981
111 4,066,982
117 R 4,066,983

CLASS 333

30 R 4,066,984
72 4,066,985
4,066,986
82 B 4,066,988
95 R 4,066,987

CLASS 335

9 4,066,989
174 4,066,990
216 4,066,991

CLASS 339

48 4,066,312
75 P 4,066,313
89 M 4,066,315
89 R 4,066,314
91 R 4,066,316
4,066,317
92 M 4,066,318
97 R 4,066,319
98 4,066,320
4,066,321
111 4,066,322
126 J 4,066,324
126 R 4,066,323
176 MP 4,066,325
221 M 4,066,326
252 R 4,066,327

CLASS 340

15.5 MC 4,066,992
15.5 TS 4,066,993
18 LD 4,066,995
18 NC 4,066,994
52 R 4,066,996
59 4,066,997
146.3 AC 4,066,998
146.3 S 4,066,999
171 R 4,067,000
237 R 4,067,004
279 4,067,005
325 4,067,006
347 SY 4,067,007
409 4,067,008

CLASS 343

5 CM 4,067,009
6.8 LC 4,067,010
4,067,011
7 A 4,067,012
7.7 4,067,013
113 DE 4,067,014
225 4,067,015
700 MS 4,067,016

CLASS 346

46 4,067,017
74.1 4,067,018
75 4,067,019
4,067,020
76 L 4,067,021

CLASS 350

7 4,066,328
77 4,066,329
80 4,066,330
103 4,066,331
126 4,066,332
160 LC 4,066,333
4,066,334
4,066,335
4,066,337
160 R 4,066,336
161 W 4,066,338
175 E 4,066,339
184 4,066,340
285 4,066,341
288 4,066,342
295 4,066,343
310 4,066,344

CLASS 352

12 4,066,963
27 4,066,345
72 4,066,346
129 4,066,348
141 4,066,347

CLASS 353

25 4,066,349
26 A 4,066,872
27 R 4,066,350

CLASS 354

7 4,067,022
23 D 4,067,023
23 R 4,067,024
62 4,067,025
77 4,067,026
79 4,067,027
137 4,067,029
139 4,067,030
141 4,067,028
195 4,067,031
288 4,067,032
289 4,067,033
310 4,067,034
313 4,067,035

CLASS 355

3 R 4,066,351
3 TE 4,066,352
4 4,066,353
28 4,066,354
38 4,066,355
63 4,066,356
66 4,066,357
75 4,066,358

CLASS 356

36 4,066,359
39 4,066,360
41 4,066,361
180 4,066,362
198 4,066,363
207 4,066,364
244 4,066,365

CLASS 357

22 4,067,036
34 4,067,037
46 4,067,038
65 4,067,039
74 4,067,040
80 4,067,041
82 4,067,042

CLASS 358

55 4,067,043
128 4,067,044
211 4,067,045
213 4,067,046
240 4,067,047
243 4,067,048

CLASS 360

14 4,067,049
40 4,067,050
95 4,067,051

CLASS 361

42 4,067,052
76 4,067,053
91 4,067,054
159 4,067,055
233 4,067,056

CLASS 362

16 4,066,884
18 4,066,885
68 4,066,886
102 4,066,889
223 4,066,888
341 4,066,887

CLASS 363

21 Re.29,510
37 4,066,954
41 4,067,057
68 4,066,955
131 4,066,956

CLASS 364

200 4,065,862
4,067,058
4,067,059
426 4,066,877
498 4,066,879
553 4,067,060
724 4,066,878
726 4,066,881
900 4,067,061

CLASS 365

12 4,067,003
43 4,067,002
174 4,067,001

CLASS 366

24 4,066,247
139 4,066,245
293 4,066,246

CLASS 401

285 4,066,366
286 4,066,367

CLASS 403

115 4,066,369
211 4,066,368
217 4,066,370
218 4,066,371
302 4,066,372
391 4,066,373

CLASS 404

117 4,066,374
121 4,066,375

CLASS 407

101 4,066,376

CLASS 408

1 R 4,066,377
46 4,066,378
125 4,066,379
4,066,380

CLASS 415

202 4,066,381

CLASS 416

186 A 4,066,382
186 R 4,066,383
189 4,066,384

CLASS 417

172 4,066,385
199 A 4,066,386

CLASS 423

32 4,066,733
61 4,066,734
159 4,066,735
386 4,066,736
447.6 4,066,737
569 4,066,738
571 4,066,739
628 4,066,740
658 4,066,741

CLASS 424

1 4,066,742
5 4,066,743
12 4,066,744
49 4,066,745
62 4,066,746
78 4,066,747
147 4,066,748
177 4,066,749
180 4,066,750
4,066,751
4,066,752
181 4,066,753
229 4,066,754
230 4,066,755
232 4,066,756
243 4,066,757
244 4,066,758
4,066,759
245 4,066,760
246 4,066,761
4,066,762
4,066,763
248.54 4,066,764
248.56 4,066,765
251 4,066,766
4,066,767
263 4,066,768
4,066,769
4,066,770
267 4,066,771
4,066,772
4,066,773
269 4,066,774
270 4,066,775
4,066,776
273 R 4,066,777
4,066,778
274 4,066,779
4,066,780
283 4,066,781
285 4,066,782
289 4,066,783
305 4,066,784
308 4,066,785
312 4,066,692
313 4,066,786
317 4,066,787
333 4,066,788
365 4,066,789

CLASS 426

8 4,066,790
39 4,066,791
41 4,066,792
60 4,066,793
61 4,066,794
259 4,066,795
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	48	246,812	D8—	14	246,823		127	246,834		90	246,849		165	246,856		15 HH	246,866
	75	246,813		67	246,824			246,835		114	246,850	D24—	8	246,857			246,867
	85	246,814		319	246,825		128	246,836		133	246,838		48	246,858	D56—	1 A	246,869
	201	246,816		354	246,826			246,837	D13—	34	246,851	D25—	68	246,859	D64—	11 B	246,870
	202	246,815		370	246,827		133	246,839	D14—	59	246,852		71	246,860	D87—	1 R	246,871
	252	246,817	D9—	267	246,828		134	246,840	D15—	4	246,853		79	246,861			246,872
D7—	1	246,818	D10—	101	246,829		136	246,841		32	246,845	D27—	39	246,862		3 C	246,873
	17	246,819	D11—	12	246,830		137	246,842		127	246,846		42	246,863		3 F	246,874
	128	246,820		125	246,831			246,843	D19—	87	246,847	D34—	5 CB	246,864		8.4	246,875
		246,821			246,832		152	246,844	D22—	18	246,854		5 CC	246,868			

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